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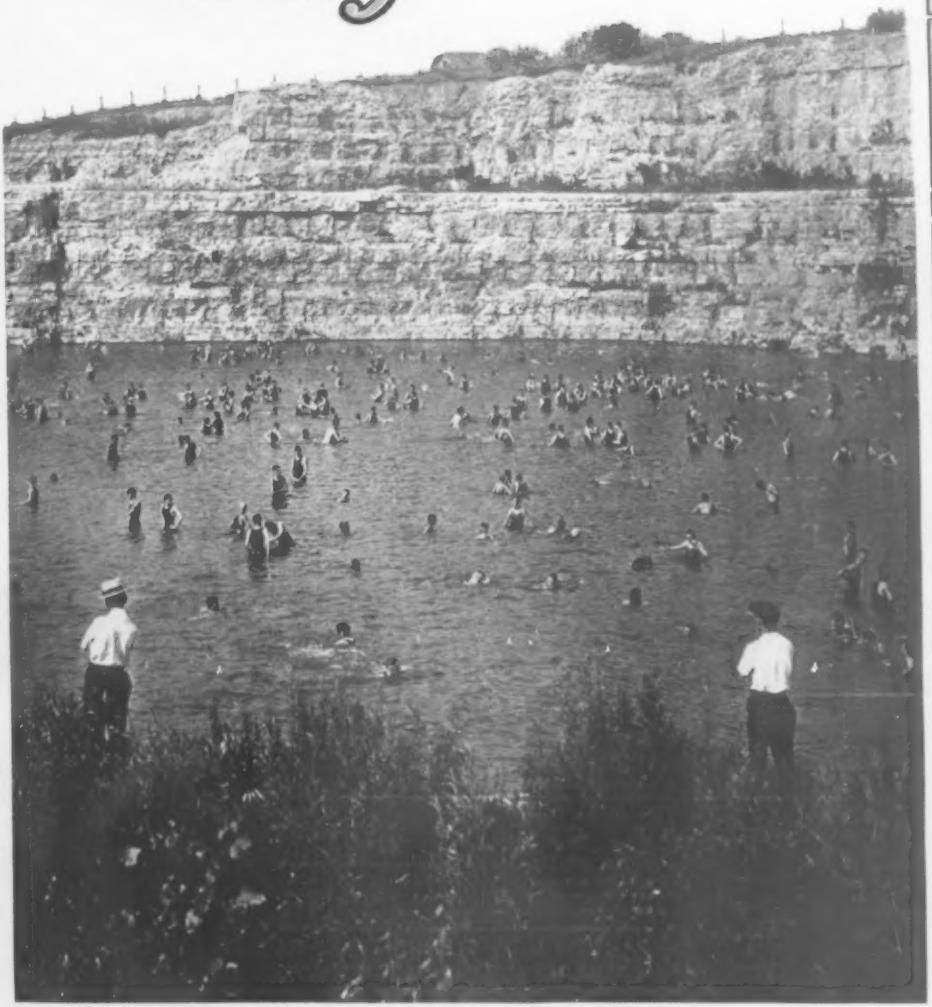
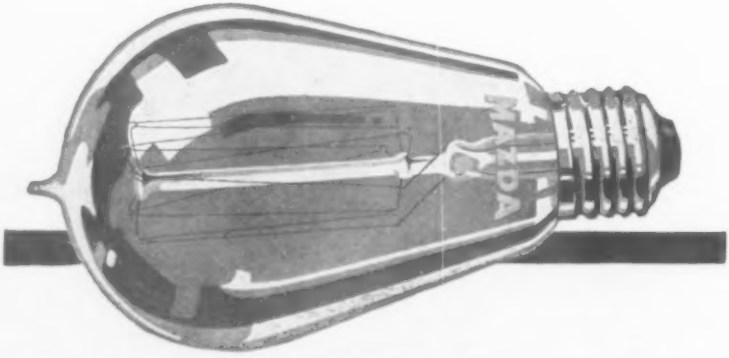


AN EXAMPLE OF MUNICIPAL RESOURCEFULNESS

An Abandoned Quarry Turned into a Municipal Swimming Pool by the City of Rockford, Ill.



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1917

Planning Sunlight Cities*

By Herbert S. Swan and George W. Tuttle

SUNLIGHT cities must be planned from the start. The width and arrangement of streets, the length and breadth of the lot, the type, height and use of building, the least dimension and orientation of courts and yards, the latitude and the topography of the site—all of these have to be considered in laying out a sunlight town. If each of these factors is given its proper weight when the town is first planned, a maximum of sunlight will be assured every home and work-place in the community, not to mention the streets, courts and yards; ignored, then no amount of replanning can ever completely rectify the mistake.

Two things are essential to a sunlight plan—a street plan and a building plan. Each of these has to be conceived and perfected in harmony with the other as one unit. They are reciprocal parts of the sunlight plan, and they therefore stand or fall together. It is impossible to give proper consideration to one without at the same time considering the demands of the other. Any other method of treatment is disastrous to the sunlight plan.

Shadows Cast by Sky-Scrapers

The street plan and the building plan have been so poorly coördinated in Manhattan, for instance, that it is safe to say that a preponderating majority of the rooms in the existing shops, factories, offices and apartments of the borough receive no direct sunshine on the shortest day in the year.

This is no less true of the residential sections than of the business sections. But the situation in the downtown financial district illustrates this condition most dramatically. There the shadows of different skyscrapers, at noon on December 21, envelop large areas. The Adams Express Building, which is 424 feet high, casts a shadow 875 feet in length; the Equitable Building, which is 493 feet high, one 1,018 feet in length; the Singer Tower, which is 546 feet high, one 1,127 feet in length; and the Woolworth Tower, which is 791 feet high, one 1,635 feet in length.

The effect of skyscrapers casting shadows from a sixth to a third of a mile in length on surrounding property is well illustrated in the case of the Equitable Building. Its shadow, which at noon on the shortest day in the year is about one-fifth of a mile in length, completely envelops an area of 7.59 acres. The ground area of the Equitable Building is only 1.14 acres.

The shadow cuts off all sunshine from the Broadway façade of the United States Realty Building, which is twenty-one stories high. The New York Title & Mortgage Company Building, fourteen stories high, and the Washington Life Insurance Building, nineteen stories high, are both completely shaded. The south side of the Singer Tower is shaded to a height of twenty-seven stories. The nearest part of the City Investing Building, 400 feet away, is in shadow for twenty-four of its twenty-six stories. Even part of the New York Telephone Building north of Cortlandt

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street is shadowed by the Equitable Building. For almost a fifth of a mile this giant skyscraper casts its shadow.

Cedar Street, the street immediately north of the Equitable Building, has an average width of 34 feet between Broadway and Nassau Street. The height of the Equitable Building is 14½ times the width of this street. On a north-and-south street of this width in New York, uniformly improved on both sides with buildings having a height equal to that of the Equitable Building, only 9.31 per cent of the windows would receive any direct sunshine at noon on the shortest day in the year. On such streets only the windows nearest the top for a distance equal to 1.35 times the width of the street would receive direct sunshine at noon on December 21 at New York (taking 40° north as the latitude), assuming the windows to be set in walls 14 inches thick. The windows in the thirty-four stories nearest the ground would receive absolutely no direct sunlight. Direct sunshine would only enter those windows in the four stories nearest the top. Not a single window within 447 feet of the street level would receive a ray of direct sunshine!

High buildings should be erected on wide streets and large open spaces; narrow streets and small open spaces should be improved with low buildings. But altho the height of a building should be proportionate to the width of the open space on each side from which it receives its sunlight, it does not at all follow that this proportion should be the same on all sides of the open space nor at all latitudes.

Effect of Latitude

The farther north a city is situated, the greater is its need for a sunlight plan. Sunlight is a natural resource to be conserved and economized like any other gift of nature. There are places on the earth's surface where the supply of sunshine is so constant that there is probably very little necessity to impose any restrictions upon its use—there is enough for all. But in contrast with these there are other places, and these places contain the great bulk of the urban population thruout the world, which possess such a fluctuating supply of sunshine that its use must be subjected to the strictest safeguards or the supply will be squandered to no purpose.

The distance from the equator is of paramount importance in planning a sunlight city. In the first place, the length of the shortest day diminishes as the latitude increases. The sunlight period at Key West on December 21 is only seven-eighths as long as that at the equator. At Winnipeg it is only two-thirds as long as that at the equator. In the second place, the angle of the sun's altitude diminishes with increased distance from the equator. At Winnipeg the altitude of the sun at noon at the winter solstice is only 16.6°. At the equator it is 66.6°.

The effect of this difference in altitude in the sunlighting of streets and buildings at different latitudes is apparent. With each additional degree of latitude from the equator, to obtain the same amount of sunlight, assuming that it could be obtained, the height of building would have to be decreased or the width of street increased.

To illustrate: Suppose that the height of buildings on the south side of east-and-west streets of a given width were limited on the principle that the sun's rays would shine for just one moment at the curb level on the opposite side of the street. On this basis buildings at Winnipeg could only be three-tenths the street width in height, while at the equator they could be 2.31 times the street width in height. In lieu of varying the height of the buildings, the above principle could be observed by varying the street width with the latitude. In that event the width of the street at the equator need be only 0.43 times the height of the building, while at Winnipeg it would have to be 3.33 times the height of the building. The street width required at Winnipeg would be 7.7 times that required at the equator.

Orientation of Streets

The orientation of streets counts for quite as much as the latitude of the locality and the height of buildings in planning a sunlight town. A little sunlight engineering in city planning can to a large extent overcome the two natural disadvantages of a northern latitude in winter—the shortness of the day and the low altitude of the sun. The fact that a sunlight plan can be designed for Winnipeg which will give the curb level in front of every house more sunshine than a non-sunlight plan will at Key West, demonstrates this conclusively.

indeed, astonishing as it may seem, the very same buildings which, if arranged along the lines of the non-sunlight plan at Key West, would rob the pavement in front of every house of all sunlight, can be arranged at Winnipeg in such a manner as to give the street in front of every house more than an hour of sunshine. In each case the buildings would be in rows and once the width of the street in height, but in the southern city it would all front on east-and-west streets, while in the northern city they would all front on north-and-south streets.

THIS BUILDING CASTS A 1,018 FOOT SHADOW

Table I shows the sunshine period at the ground level of the street façade. This is given for different latitudes and for each side of streets oriented in different directions and improved with buildings of different heights. The table also shows the sunlight period at any distance below the top of the building given in the left-hand column. The times have been worked out for every five degrees from 25° north latitude to 50° north latitude inclusive. These latitudes include all of the United States and a large portion of Canada. Cities near or at the different latitudes are: 25°, Key West; 30°, New Orleans and Houston; 35°, Memphis and Albuquerque; 40°, Philadelphia, Indianapolis and Denver; 45°, Minneapolis and Portland, Ore., and 50°, Winnipeg. The streets used include those oriented north and south and those oriented every 15 degrees west of south to and including east-and-west streets. Data for streets oriented east of south are identically the same as for streets oriented west of south, except that the sides of the streets are reversed. The height used is in each instance a multiple of the street width, this multiple varying from one-half times the street width to six times the street width, the higher multiple being worked out primarily for alleys and rear yards. Both streets and alleys are assumed to be open at either end for an indefinite distance.

The sunshine period given in this table is that received by the street façade at a given distance below the top of the buildings on the opposite side of the street. The amount entering a window at any particular height is, of course, less than that falling on the façade. The number of minutes of sunshine received by the façade cut off from entering a standard window by an 8-inch wall is indicated in the last line of the table

TABLE I. SUNSHINE PERIOD AT GROUND LEVEL OF STREET FACADE.

For different latitudes and for each side of streets oriented in different directions, and improved with buildings of different heights. Winter solstice.

Height of building in terms of street width	Orientation of Street. South (Side of street) e.s. (Time in hours and minutes) h.m.	South w.s. h.m.	15° W. e.s. h.m.	15° W. w.s. h.m.	30° W. e.s. h.m.	30° W. w.s. h.m.	45° W. s.s. h.m.	45° W. n.s. h.m.	60° W. s.s. h.m.	60° W. n.s. h.m.	75° W. s.s. h.m.	75° W. n.s. h.m.	West s.s. h.m.	West n.s. h.m.
25° North Latitude.														
½	3 24	3 24	2 58	3 54	2 24	4 38	1 40	5 46	0 30	7 25	.....	8 04	.....	8 08
1	2 18	2 18	1 06	2 32	1 45	3 00	1 18	3 39	0 21	4 39	.....	0 34	.....	.....
1½	1 42	1 42	1 38	1 43	1 22	2 08	1 03	2 27	0 18	2 38	.....	.....	.....	.....
2	1 23	1 23	1 19	1 30	1 06	1 36	0 50	2 00	0 16	1 30	.....	.....	.....	.....
2½	1 04	1 04	0 62	1 11	0 53	1 20	0 48	1 23	0 14	1 08	.....	.....	.....	.....
3	0 56	0 56	0 52	0 59	0 51	1 01	0 42	1 04	0 13	0 48	.....	.....	.....	.....
4	0 45	0 45	0 44	0 46	0 43	0 49	0 38	0 54	0 12	0 38	.....	.....	.....	.....
5	0 39	0 39	0 38	0 40	0 38	0 43	0 33	0 43	0 10	0 29	.....	.....	.....	.....
6	0 35	0 35	0 34	0 37	0 35	0 39	0 31	0 40	0 09	0 24	.....	.....	.....	.....
Deduct for windows	41	41	46	41	56	47	1 22	59	Entire time	1 28	.....	.....	.....	.....
30° North Latitude														
½	3 10	3 10	2 41	3 44	2 07	4 24	1 24	5 31	0 18	7 07	.....	6 54	.....	6 28
1	2 07	2 07	1 51	2 24	1 28	2 45	1 20	3 16	0 12	3 46	.....	.....	.....	.....
1½	1 34	1 34	1 24	1 41	1 10	1 52	0 50	2 05	0 10	1 37	.....	.....	.....	.....
2	1 16	1 16	1 06	1 18	0 57	1 26	0 43	1 29	0 08	0 48	.....	.....	.....	.....
2½	0 58	0 58	0 55	1 03	0 51	1 07	0 37	1 05	0 06	0 35	.....	.....	.....	.....
3	0 50	0 50	0 48	0 52	0 45	0 54	0 35	0 54	0 06	0 22	.....	.....	.....	.....
4	0 42	0 42	0 40	0 43	0 38	0 45	0 31	0 45	0 06	0 19	.....	.....	.....	.....
5	0 37	0 37	0 35	0 38	0 33	0 40	0 26	0 38	0 05	0 13	.....	.....	.....	.....
6	0 33	0 33	0 32	0 33	0 31	0 37	0 25	0 34	0 05	0 12	.....	.....	.....	.....
Deduct for windows	43	43	49	43	57	49	1 20	59	Entire time	1 23	.....	.....	.....	.....
35° North Latitude.														
½	2 52	2 52	2 25	3 30	1 51	4 07	1 06	5 04	0 06	6 35	.....	5 36	.....	4 50
1	1 52	1 52	1 38	2 08	1 20	2 28	0 50	2 44	0 05	2 23	.....	.....	.....	.....
1½	1 23	1 23	1 11	1 32	1 00	1 40	0 41	1 40	0 04	0 30	.....	.....	.....	.....
2	1 10	1 10	0 57	1 10	0 47	1 13	0 35	1 06	0 02	0 10	.....	.....	.....	.....
2½	0 53	0 53	0 45	0 55	0 43	0 55	0 30	0 50	.....	0 07	.....	.....	.....	.....
3	0 46	0 46	0 43	0 47	0 38	0 47	0 28	0 44	.....	.....	.....	.....	.....	.....
4	0 38	0 38	0 36	0 39	0 32	0 40	0 24	0 35	.....	.....	.....	.....	.....	.....
5	0 34	0 34	0 32	0 35	0 31	0 34	0 19	0 31	.....	.....	.....	.....	.....	.....
6	0 30	0 30	0 29	0 31	0 27	0 30	0 17	0 26	.....	.....	.....	.....	.....	.....
Deduct for windows	45	45	50	46	58	51	Entire time	60	Entire time	1 16	.....	.....	.....	.....
40° North Latitude.														
½	2 37	2 37	2 04	3 07	1 33	3 45	0 50	4 32	....	5 10	.....	3 06	.....	.....
1	1 40	1 40	1 25	1 52	1 04	2 04	0 38	2 04	.....	.....	.....	.....	.....	.....
1½	1 10	1 10	1 00	1 20	0 50	1 20	0 28	1 08	.....	.....	.....	.....	.....	.....
2	1 00	1 00	0 50	0 59	0 44	1 00	0 25	0 46	.....	.....	.....	.....	.....	.....
2½	0 47	0 47	0 41	0 48	0 35	0 47	0 23	0 35	.....	.....	.....	.....	.....	.....
3	0 41	0 41	0 37	0 42	0 32	0 37	0 20	0 31	.....	.....	.....	.....	.....	.....
4	0 34	0 34	0 31	0 34	0 27	0 34	0 18	0 25	.....	.....	.....	.....	.....	.....
5	0 30	0 30	0 29	0 31	0 23	0 30	0 14	0 21	.....	.....	.....	.....	.....	.....
6	0 27	0 27	0 24	0 27	0 22	0 26	0 14	0 19	.....	.....	.....	.....	.....	.....
Deduct for windows	48	48	52	48	58	53	Entire time	60	.....	59	.....	.....	.....	.....
45° North Latitude.														
½	2 18	2 18	1 48	2 44	1 15	3 13	0 35	3 45	....	2 50	.....	.....	.....	.....
1	1 24	1 24	1 10	1 34	0 48	1 40	0 24	1 24	.....	.....	.....	.....	.....	.....
1½	0 58	0 58	0 50	1 03	0 38	1 02	0 21	0 48	.....	.....	.....	.....	.....	.....
2	0 49	0 49	0 43	0 48	0 32	0 46	0 16	0 32	.....	.....	.....	.....	.....	.....
2½	0 38	0 38	0 33	0 40	0 25	0 37	0 13	0 24	.....	.....	.....	.....	.....	.....
3	0 34	0 34	0 31	0 35	0 24	0 32	0 13	0 20	.....	.....	.....	.....	.....	.....
4	0 28	0 28	0 27	0 29	0 21	0 27	0 12	0 19	.....	.....	.....	.....	.....	.....
5	0 25	0 25	0 22	0 25	0 18	0 23	0 09	0 14	.....	.....	.....	.....	.....	.....
6	0 22	0 22	0 21	0 23	0 17	0 20	0 08	0 12	.....	.....	.....	.....	.....	.....
Deduct for windows	50	50	54	50	59	54	Entire time	1 01	.....	.....	.....	.....	.....	.....
50° North Latitude.														
½	1 52	1 52	1 27	2 14	0 55	2 36	0 22	2 39	.....	.....	.....	.....	.....	.....
1	1 06	1 06	0 52	1 13	0 36	1 10	0 15	0 36	.....	.....	.....	.....	.....	.....
1½	0 47	0 47	0 38	0 47	0 28	0 50	0 10	0 21	.....	.....	.....	.....	.....	.....
2	0 41	0 41	0 32	0 38	0 23	0 40	0 08	0 15	.....	.....	.....	.....	.....	.....
2½	0 30	0 30	0 27	0 31	0 20	0 30	0 07	0 13	.....	.....	.....	.....	.....	.....
3	0 27	0 27	0 24	0 29	0 17	0 23	0 06	0 10	.....	.....	.....	.....	.....	.....
4	0 22	0 22	0 20	0 25	0 15	0 19	0 06	0 08	.....	.....	.....	.....	.....	.....
5	0 20	0 20	0 17	0 22	0 13	0 17	0 04	0 07	.....	.....	.....	.....	.....	.....
6	0 18	0 18	0 16	0 19	0 12	0 15	0 04	0 03	.....	.....	.....	.....	.....	.....
Deduct for windows	51	51	55	53	Entire time	55	Entire time	1 01	.....	.....	.....	.....	.....	.....

for each latitude. The standard window considered is one with a glass surface 32 inches wide and 61½ inches high, the opening between the stop beads being 36 by 66 inches. For a wall thicker than 8 inches the amount of sunshine cut off from the

TABLE II.—NUMBER OF DAYS CURB LEVEL IS IN SHADOW ON EAST AND WEST STREETS.

Height of building in terms of street width	North Latitude 25°	30°	35°	40°	45°	50°
	Number of Days					
½	0	0	0	0	73	108
1	61	98	127	153	181	182
1½	135	161	182	182	182	182
2	172	182	182	182	182	182
2½ and over	182	182	182	182	182	182

window would be greater than that stated in the table.

The number of days that the north façade of an east-and-west street is shaded at the street level depends upon the latitude and the height of the buildings. Buildings once the street width in height at Key West cut off all sunlight for 61 days in the year; at Winnipeg for 182 days. In very few cities of the United States does the sun penetrate down to the sidewalks on east-and-west streets in the skyscraper district for more than half the year. The alleys and yards back of such buildings are often so narrow as to shut out all the noonday sunlight thruout the year at the bottom level.

Table II shows the number of days in the year that the north façade at the curb level of east-and-west streets situated at different latitudes and improved with buildings of different heights receives absolutely no sunlight.

The street system of Manhattan (40° 45′ N. Lat.) is an excellent illustration of what a sunlight plan should not be. The blocks, in brief, are 200 feet wide and as much as 920 feet long, the narrow dimension being oriented 28° 30′ west of south and the long dimension 61° 30′ east of south. This arrangement is most unsatisfactory. Where a block of the above dimensions is uniformly improved with buildings once the street width in height, a height which allows the construction of a six-story tenement house, only the two ends near the avenues receive any sunlight at all at the curb level on the shortest day in the year. In other words, the tenement houses fronting on the streets embracing 82 per cent of the total block frontage receive no sunlight at the ground except near the ends of the block, due to the avenues. If the long side of the blocks paralleled the avenues instead of the streets in Manhattan, the situation would be very much improved. But 18 per cent of the frontage would then be in shadow at the curb level. Sunlight homes and sunlight streets would then be given to an additional 64 per cent of the population. The effect of this increase in sunlight on individual initiative and vigor, on public health, on sanitation, on the spread of contagious disease, on snow removal and on traffic conditions, can be imagined.

EDITOR'S NOTE.—The second portion of this article, entitled "Minimum Standards of Sunlight," will appear in the October issue of THE AMERICAN CITY.

The Water Supply of Clarksburg, W. Va.

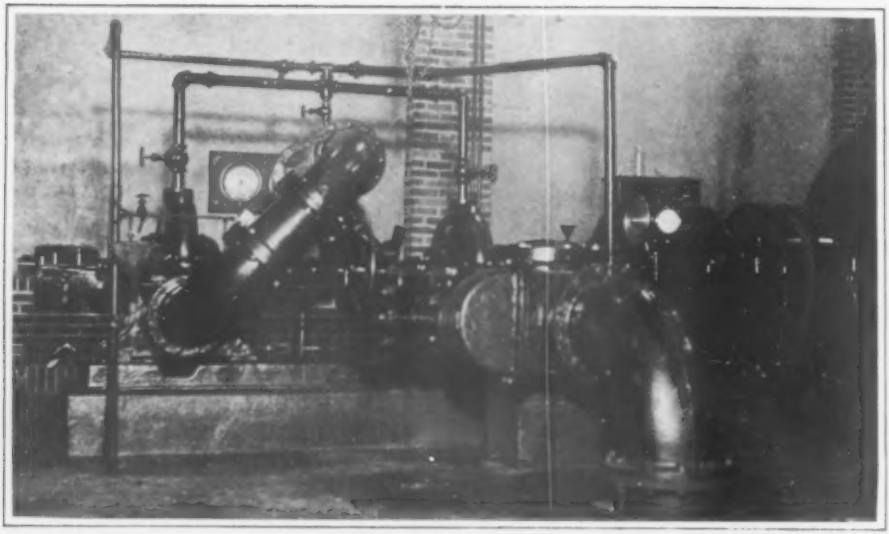
By Perkins Boynton
Chemist in Charge

THE city of Clarksburg, W. Va., is fortunate in having a modern, well-equipped pumping station, an extensive distributing system and an up-to-date filtering and sterilizing plant, able to deliver a sufficient quantity of pure, clear water to its citizens at all times. The growth of the entire system from its origin, in 1888, to the present time has been continuous, to keep step with demands for more and better water.

In 1888, with John W. Hill, of Cincinnati, Ohio, as consulting engineer, the city built a pumping station containing two Deane pumps, total capacity 750,000 g. p. d.* and two 70-H. P. horizontal tubular boilers, a distributing system consisting of two steel tanks holding 560,000 gallons of water for storage and to maintain pressure, and 6 miles of mains.

In the following twenty-five years this equipment of the pumping station was replaced by three Laidlaw-Dunn-Gordon

* Gallons per day.



HIGH LIFT CENTRIFUGAL PUMP AT CLARKSBURG WATER WORKS

tandem compound duplex plunger pumps, two 1,000,000 g. p. d. and one 2,000,000 g. p. d, for high-lift, and three Worthington centrifugal pumps, two low-lift 3,000,000 g. p. d. and one high-lift 3,000,000 g. p. d., and two 125-H. P. return tubular boilers and four 200-H. P. horizontal water-tube boilers (two Erie City and two Keeler). For about ten years the fuel used was coal; since then natural gas has been used, at the present time taken from two wells drilled by the Water Board on its own ground.

In 1911 a concrete storage and equalizing tank, 85 feet in diameter and 27 feet high, with a capacity of 1,000,000 gallons, was added to the distributing system, maintaining a pressure of 110 pounds at the center of the city. There are 25 miles of mains in the city at the present time.

At the same time that the storage capacity was increased, the quality of the water was greatly improved by the addition of a purification plant adjoining the pumping station. The New York Continental Jewell Filtration Company, of New York, built and equipped this plant with modern appliances for operating tables, solution tanks and measuring devices for chemical solutions after the designs of Hering and Fuller, of New York. There are four filter units with a total area of sand surfaces of 872 square feet and a combined capacity of 4,000,000 g. p. d. The filters are washed by the application of air and water, supplied to the filters from a blower and a centrifugal pump, respectively, actuated by Pelton wheels operated with water from the high-pressure line. The wash water is taken from the clear-water well. The coagulant solution tanks are of concrete, capacity 2,700 gallons; the lime tanks are of steel, capacity 1,350 gallons, and the hypochlorite tanks are concrete, capacity 460 gallons. These tanks are fitted with mechanical stirring paddles driven by shafting connected with Pelton wheels. The coagulant and lime are fed into the low-lift line from the river to the settling basin against a head of 14-15 feet, by Schutte-Koerting water jets. The hypo solution falls into the sump of the high-lift suction line, located in the clear-water well. A complete bacteriological and chemical laboratory is included in the filter plant.

During the past year the following units have been added to the pumping station, to be used independently of the old equipment: one 350-H. P. Bruce-Macbeth natural gas engine, direct-connected by flexible couplings to a DeLaval centrifugal pump, with helical speed-increasing gear (200-1,385 r. p. m.); one 50-H. P. Bruce-Macbeth natural gas engine, direct-connected thru flexible couplings to a DeLaval centrifugal pump with helical speed-increasing gears

(300-1,430 r. p. m.). The capacity of these pumping units is 4,000,000 g. p. d. each. The air compressor used to start the gas engine is driven by a 6-H. P. Novo gas engine. The air-storage tank, separate meters for gas engine, mufflers and exhaust piping are placed in the basement. On a continuous ten-day test run, the large engine required 300 H. P. to deliver 4,000,000 g. p. d. against a total head of 326 feet. Thruout the test, 10.31 cubic feet of gas per brake horse-power was the average for high- and low-lift units. This is low, as they were run below the rated horse-power. The efficiency of the high-lift pump was 78 per cent and of the low-lift pump 70 per cent, which was above specifications.

SETTLING BASIN IN FOREGROUND, FILTERS AND PUMPING PLANT IN BACKGROUND, CLARKSBURG, W. VA.

The water which reaches the filter plant is taken from the West Fork of the Monongahela River, about 75 miles from the head waters, as the river flows. The soil over which the water flows is largely limestone, with some dolomite, giving up to the water carbonates of calcium and magnesium, which are partly, sometimes almost wholly, changed to sulphates by the sulphuric acid from the coal mines. The oil and gas wells along the banks supply salt in abundance. The hardness, at times of drought, is 350 parts per million, and the alkalinity 10 to 30 parts per million. This large amount of incrustants makes softening expensive, and softening has been resorted to only twice.

In the spring of 1916, iron and lime were substituted for alum as a coagulant, on account of the increasing cost of the latter. Equally good results have been obtained with the same amounts of iron as of alum. At the time the change was made the average costs were $5 per million gallons of water pumped for iron and lime, and $13 for alum, including lime when necessary to increase alkalinity. Under certain conditions of high water, the mine wastes bring sufficient iron into the river to cause coagulation of the mud, which settles out before it reaches the plant, leaving a clear water with enough dissolved iron in it to be thrown out by the lime and thus produce the necessary coating for the filter surface. This results in a considerable saving of iron for coagulant. Lime is always added to the water to eliminate the free CO_2 which is present in from 8 to 25 parts per million.

Since the introduction of the lime and iron process and the consequent elimination of free carbon dioxide, the amount of hypo required to give a water free from B. Coli has increased, which is in accord with the accepted theory, that carbon dioxide aids the action of the hypochloride as a germicide.

The additions and improvements, since 1910, are largely the result of the untiring efforts of the secretary and general manager, Scotland G. Highland.

Experience with Water Meters at Elgin, Ill.*

By C. L. Kohn

Commissioner of Public Health and Safety, Elgin, Ill.

THE City of Elgin owns all water meters, with the exception of those owned by consumers using more than 10,000 cubic feet per quarter, and under ordinance these are purchased and owned by the consumer. The only cost to the consumer is the preparation of plumbing for the installation of the meter, the Water Department seeing that meters are so placed that freezing is reduced to a minimum.

Good plumbing is an essential of good water service. The Department of Plumbing Inspection is connected with the Water Department, and no work of any kind can be done by the plumber without obtaining a permit from the office. After work is completed it is inspected, for which the Department receives a fee of $2. This insures the householder a first-class installation, as required by city ordinance. The Water Department makes all repairs on meters, and for this work the consumer is charged only to the extent of actual costs. Under no circumstances are plumbers allowed to install or repair meters, for it would then be impossible for the Department to keep a proper check on the work. The Repair Department is complete in every respect, and the cost of maintenance of meters is very low.

For the reading of meters, the city is divided into three districts, meters in each district being read every quarter. The results are most satisfactory and economical, for the following reasons: first, a certain amount of revenue is received monthly with which to do business, enabling the Department to take advantage of discounts in the purchase of supplies and materials; second, the office force is materially reduced, as well as the number of meter readers, and the readers alternate, in no case reading the same meter in two successive quarters, thus avoiding carelessness and errors.

The city of Elgin began installing meters in 1902. At the end of the year there were 3,263 consumers, and of these 210 were metered. The pumpage for the year was 725,000,000 gallons, and the revenue $30,013.68. In 1910 the city had 4,655 consumers, of whom 2,728 were metered. The pumpage was 787,000,000 gallons and the revenue $53,687.63. In 1915 the city had 5,226 consumers, of whom 5,200 were metered, practically 99 per cent. For various reasons 26 consumers could not be metered. The pumpage for 1915 was 413,360,580 gallons and the revenue $54,223.88, showing an increase in revenue of $14,210.20 over the year 1902, and a decrease of 311,639,420 gallons in pumpage, notwithstanding the fact that the number of consumers had increased by 1,963. All public buildings, parks and drinking fountains are metered.

All consumers, whether it is the large manufacturer or the small householder, pay the same amount for the same quantity of water, the rates being on a sliding scale as follows:

For first 166 cubic feet or under at the rate of $1.25 per 666 cubic feet.

For each 100 cubic feet in excess of 666 cubic feet up to 3,333 cubic feet, 15 cents.

For each 100 cubic feet in excess of 3,333 cubic feet up to 10,000 cubic feet, 11½ cents.

For each 100 cubic feet in excess of 10,000 cubic feet up to 26,000 cubic feet, 7½ cents.

For each 100 cubic feet in excess of 26,666 cubic feet, 5½ cents.

The minimum charge is $5 per annum, and if at the end of the year less than $5 worth of water has been used, the small consumer, realizing that he might as well use the balance of the water rather than pay for what he has not used, generally uses it to beautify his lawn and garden, thus indirectly helping the movement toward a "City Beautiful."

The Water Department of the city of Elgin is absolutely self-sustaining, retiring all bonded indebtedness, making all betterments, as well as installing all mains, etc., from its earnings, and has been able in addition to use part of its earnings to equip some of the Fire Department with motor-driven apparatus and still have a balance for the sinking fund.

* From a paper read before the Illinois Section of the American Water Works Association.

Coöperation the Keynote in Dallas Public Health Activites

"The City Is Our Home—Help Us Keep It Clean and Healthful"

By Charles Saville
Director of Public Health, Dallas, Tex.

THE success of a department of public health, as well as of any other municipal organization, rests largely on three factors: administrative officials who have the interest of the organization at heart; trained department executives, aided by real team-spirit within the organization, and unstinted coöperation from the public.

The Mayor and City Commissioners of Dallas have had the interests of the Department of Public Health continually at heart and have taken no small part, thru counsel and encouragement, in bringing about its present effectiveness. The men working within the organization have displayed a loyalty worthy of more than passing mention; they have systematically enforced the rules and principles of public health protection, often against opposition that seemed almost sure to win, only to be rewarded with a success far beyond their highest expectations.

The coöperation of the public has been perhaps the greatest single factor in aiding the Department to carry out its program of public health service. This has been best exemplified thru the work of the Public Health Committee of the Chamber of Commerce and Manufacturers' Association, and is largely due to the fact that the Chairman of the Committee, one of the successful business men of the city, and president of a large commercial organization, has an unusually clear understanding of the purposes of modern health protection activities. He has also given freely of his time to awaken an interest in this work on the part of the public. The Chamber of Commerce, being our largest business men's organization, has a great deal of weight among the people, and the fact that this organization devotes so much time and interest to public health work increases the importance of the work in the eyes of the public.

The Chamber of Commerce Public Health Committee has not only interested itself in all our Health Department activities, and emphasized their importance to the people, but it has maintained a full-time trained secretary, and has carried on a large amount of special educational work in connection with the organization and direction of Junior Health Leagues, Little Mothers' Clubs and special campaigns among the school children looking to the extermination of flies and mosquitoes.

The activities of the Committee are not confined to the city limits, but spread out over the entire county; only recently the committee was an important factor in securing for Dallas County a comprehensive survey, which is to be made shortly by the State Board of Health and the International Health Board. The same committee has recently aided in organizing a local branch of the National Association for the Study and Prevention of Tuberculosis. The Chairman of the Chamber of Commerce Committee is also a member of the City Health Board. Several of the most active members of the Committee, in addition to the Chairman, are successful business men. On several occasions when special appropriations for health protection activities have been under consideration by the Board of City Commissioners, the Committee has appeared before the Commissioners in behalf of the appropriation, and often with very favorable results.

With all this coöperative effort on the part of the administrative officials, the men within the organization and the Chamber of Commerce representing the public interest, nothing but success can attend their efforts. The Department of Health consists of a board of thirteen members, six of whom are required to be practicing physicians. The Mayor appoints the members of the board, with the approval of the City Commissioners, and is himself the presiding

officer *ex-officio*. The members serve without compensation and hold office during the pleasure of the Mayor. The board has general supervision and control over all matters pertaining to the health of the community, and over the enforcement of all laws, ordinances, rules and regulations dealing with public health, and the supervision and prevention of communicable diseases.

The Department of Health occupies a rather unique position in the city government, because in addition to its administrative powers it acts in an advisory capacity to the Police Department, the Department of Public Welfare, the Engineering Department, the Departments of Street Cleaning and Refuse Disposal, the Legal Department and the Water Department. Coöperation is here again active in the mutual aid of these city departments. The Department of Health is also constantly receiving and giving aid to state and federal health organizations.

Space would not permit a review of the entire work of the Dallas Health Department, but in the following paragraphs are described some of the more recent activities which indicate the work that is unceasingly being carried on. Each year brings new problems, but new ideas and increased knowledge of the general conditions about Dallas enable the officials to meet these difficulties and successfully combat them to such a degree that Dallas is now proud of the work of the past and looks forward to even greater successes in the future.

The Monthly Bulletin

As one effective means of informing the public on matters pertaining to public health, the Department has published regularly during the last two years a monthly bulletin which brings timely problems to the attention of the public for their consideration. It must not be thought that these bulletins are the only means of spreading health doctrines, for the newspapers play a very important and effective part, but it was thought advisable to publish a bulletin which would carry with it the official sanction and weight of the Department. It has proved of great value in securing the cooperation of the citizens of the city proper as well as those beyond the city limits.

CLEAN CITY
BOOK MARK

DEPARTMENT OF HEALTH
DALLAS, TEXAS

SPRING IS HERE. It's time to clean up. Let's all help to make Dallas a more attractive and healthful city.

Keep your yard, in front and rear, neat and clean. Ask your neighbors to do likewise.

Plant trees, shrubs, vines and flowers.

Destroy weeds. Put garbage, rubbish and manure in covered fly-tight receptacles. Such refuse breeds flies and insects which are dangerous because they spread disease. Cleanliness is cheaper than sickness.

Spare the birds. They destroy worms and insects, thus preserving the flowers and trees and helping to make the city beautiful.

AT THE SUGGESTION OF A MEMBER OF THE STAFF OF THE DALLAS PUBLIC LIBRARY THESE BOOKMARKS WERE PRINTED AND ONE ENCLOSED IN EACH BOOK TAKEN OUT FOR SOME TIME PRIOR TO A CLEAN-UP CAMPAIGN. THUS THE PUBLIC LIBRARY OFFICIALS CO-OPERATED WITH THE HEALTH DEPARTMENT, MUCH TO THE ADVANTAGE OF THE CITY.

Progress with the Dairies

When the new Department of Health came into existence in 1915 there was need of regulation of the dairies selling milk in Dallas. To secure control over the situation, permits were required to be secured by each and every dairy having any trade in Dallas. This was supplemented by the score system, which has been followed here with much success. The average sanitary "score," as determined by the federal score card, was only 52 out of a possible 100 when the Department made its first inspection in 1915. At the present time the average has risen to 76, representing an increase of 45 per cent. There are now nearly 550 dairies operating under permits issued by the Health Department. In order to help the dairies which had low scores, a special single sheet bulletin was published, telling "How to Produce Clean, Safe Milk."

One result of this has been stated above; another is that while only 4 dairies showed a score of 80 or better in September, 1915, there are at the present time 75 dairies having a score of 80 or better, and these 75 dairies supply 41 per cent of the milk sold in the city.

Realizing that the people of Dallas wish to drink only clean, pure milk, and recognizing that there are always dangers connected with the operation of dairies which maintain only average conditions of cleanliness, the City Board of Health raised the minimum requirements for a permit to sell milk in Dallas in August, 1916, from 60 to 70 points on the score. The scores of all dairies are furnished to consumers on request. We had about 9,000 such requests in 1916. Nearly 1,500 dairy scores were made in the fiscal year 1916-1917.

The Work of the Public Health Nurse

The public health nurse is one of the most effective means of teaching the poorer mothers to properly care for their babies, their children and themselves. There are thousands of mothers, who are either working or do not know how to read, who learn very little about health protection thru the press or printed bulletins. It is to these people that the nurse is a great aid. She teaches the young mother in her home how to properly care for her infant; if a physician is needed she calls him, and if any quick first aid is needed she can give it at once. During the year 1915-1916 there were 3,552 visits by public health nurses in Dallas, and this was increased to 4,962 visits last year. Dallas, with a population of 124,527 in 1916, had only four public health nurses, while Toronto, Canada, had forty-four for a population of 450,000. This is a good argument for an increase in the number of nurses. In our last annual report we asked that the size of the district visited by each nurse might be reduced so that she could make more frequent visits where her services are most needed. The nurses visit, in so far as practicable, all patients discharged from the city hospitals, to insure that the benefit of the care and treatment received at the institution may not be lost because of carelessness or lack of facilities in the home.

"Who Bakes Your Bread"

Under this caption in one of our health bulletins we have discussed the bakery problem. The bakeries are scored on a system somewhat similar to that used for dairies and other food-producing establishments. Reproduced herewith are copies of the bakery and soda fountain score cards.

Shortly after the adoption of the score card system for places where food products are sold, there was a marked increase in the scores of groceries, markets, restaurants and soda fountains, in some cases amounting to more than 25 per cent. The bakeries, on the other hand, showed a falling off in their sanitary scores. The conditions in some of the bakeries in 1916 were absolutely filthy, and the scores for 32 bakeries averaged only 51 out of a possible 100, as compared with 68 for restaurants, 73 for groceries, 74 for markets and 80 for fountains. A few of the bakeries were making genuine efforts to improve their methods, and during the month of May, 1916, five concerns spent more than $1,000 in a general clean-up, but, unfortunately, most of them continued their antiquated methods in unclean surroundings. Two of the worst bakeries were prosecuted in the corporation court, with the result that one went out of business altogether and the other was convicted.

We stated all these facts in one of our Bulletins and asked every citizen to aid us in the fight for cleanliness by refusing to purchase bread at a bakery where the score was less than 75. Within forty-eight hours

P-N. 9 1M—7-16

BAKERY SCORE CARD —CITY OF DALLAS— HEALTH DEPARTMENT

CHARLES SAVILLE, DIRECTOR OF PUBLIC HEALTH — N. C. HAMNER, CHIEF OF BUREAU OF SANITARY INSPECTION

OWNER
MANAGER ..... LOCATION .....

INSPECTED BY ..... ON ..... 19 ..... A. M. P. M.

		SCORE PERFECT	SCORE ALLOWED
MANUFACTURING	Condition of Floors 4, Walls 3, Ceilings 3	10	
	Light 2, Ventilation 3	5	
	Flies and Insects, Freedom From, Including Screens	5	
	Condition of Pans 3, Racks 2, Mixers 3, Machines 2	10	
	Condition of Storage Racks	5	
HANDLING AND SELLING	Condition of Storage and Supplies	10	
	Protection from Flies, Dust, Etc.	5	
	Cleanliness of Show Cases, Trays, Pans, Wagons, Etc.	5	
	Protection from Hands 7 and Clothing 8 of Employees (Wrapping)	15	
	Health 5 and Cleanliness 10 of Employees	15	
	Toilet Arrangements 2, Facilities for Washing 3	5	
	Condition of Sidewalk 1, Street 1, Stable 4, Yard 2, Alley 2	10	
	TOTAL SCORE	100	

FOR ANY PARTICULARLY BAD CONDITION, THE SCORE SHALL BE STILL FURTHER REDUCED.
FOR INFECTIOUS DISEASE AMONG EMPLOYEES, SCORE SHALL BE 0

we had 500 telephone requests for information regarding the sanitary score of individual bakeries. In other words, the consumers wanted to know how much dirt, if any, they were eating in their bread.

And what were the results? One bakery, which at the time had a score of only 40, lost nearly all its customers. It got busy immediately and cleaned up. Since then it has spent over $25,000 for a modern sanitary plant and equipment; it now has a score of over 80 and is trying to get back its customers. Another bakery which had a score of 90 at the time of the publicity mentioned,

FOUNTAIN SCORE CARD CITY OF DALLAS— HEALTH DEPARTMENT

CHARLES SAVILLE, DIRECTOR OF PUBLIC HEALTH — N. C. HAMNER, CHIEF OF DIVISION OF FOOD & MILK INSPECTION & ANALYSIS

OWNER
MANAGER ..... LOCATION .....

INSPECTED BY ..... ON ..... 19 ..... A. M. P. M.

	SCORE PERFECT	SCORE ALLOWED
Condition of Floors 4, Tables 2, Chairs 1, Walls 1, Ceilings 2	10	
Light 2, Ventilation 3	5	
Flies and Insects, Absence of Including Screens and Protection from Street Dust	10	
Condition of Implements and Utensils for Mixing 10, for Serving 5	15	
Condition of Fruit and Syrup Containers	5	
Storage Facilities for Food Supplies	10	
Character of Food Supplies (Milk Permit)	5	
Handling of Food Supplies (Preparation 5, Serving 5)	10	
Health 5 and Cleanliness 10 of Employees	15	
Toilet 2 and Washing 3 Facilities	5	
Condition of Premises (Sidewalk 2, Street 2, Yard 3, Alley 3)	10	
TOTAL SCORE	100	

FOR ANY PARTICULARLY BAD CONDITION, SUCH AS COMMUNICABLE DISEASE AMONG EMPLOYEES, OR FAILURE TO OBTAIN MILK PERMIT, SCORE TO BE REDUCED STILL FURTHER.

had its business increased more than 50 per cent. by new customers in less than a week.

On the whole, the bakers have learned that Dallas people want to eat clean bread, and the various plants now show an average score of about 80, which represents an improvement of more than 50 per cent.

One of the features of our Bulletin which appears in every issue is the brief remark at the end of almost every article: "For further information apply at Room 106, Municipal Building, or phone S. W. Main 8,000, Auto M 4565." These items have been productive of a greater number of inquiries on the part of the people and have brought our work nearer to them. It has aided and increased coöperation, for whenever a citizen or householder wants to know anything whatsoever concerning a topic connected with our department, he has only to call us by 'phone or call in person and his question is answered by the highest official available who is acquainted with the topic.

"A Case of Prunes"

One of the most important activities of the health department is the work of general food inspection. There are so many cases of adulteration, intentional or otherwise, so much placing of poor material on the market, that this division is recognized as of the greatest importance. Just one case of its work taken from a copy of the Bulletin will suffice to show its value:

"Some months ago a well-known wholesale dealer bought, thru certain brokers, two carloads of assorted dried fruits from a factory in another state. Upon receipt of same the dealer found thirty cases of dried prunes weighing fifteen hundred pounds to be of inferior grade, unsound and infected with worms, and thereupon notified the brokers, who took the matter up with the factory, asking for instructions regarding the disposal of the fruit. The factory authorized the brokers to take back the spoiled prunes and to give the dealer credit, and then to have the prunes removed to a warehouse and proceed as follows:

"'Open all cases, empty fruit from same, break well apart and spread out, using cloth or paper to protect fruit from ground or floor. Next, take the fruit, a few pounds at a time, and immerse in boiling water, to which a liberal quantity of salt has been added. After boiling fruit two or three minutes, remove the water and spread out to dry. When all has been thus treated, repack in boxes, using clean, fresh paper to reline same, and hold shipment for further information.'

"Upon receipt of these instructions the brokers transferred the fruit from the dealer's premises to a local warehouse and instructed the manager by letter to see that the prunes were treated and reprocessed as per instructions from the factory. Acting for the brokers, the manager immediately secured the service of a man, made all arrangements and carried out the instructions to the point of repacking the fruit.

"Just here the Health Department Inspector learned about the case and ascertained the fact that while countless thousands of fat young worms had been brought to an untimely end by being 're-processed' in boiling salt water, they had nevertheless not been removed and the quality of the prunes had not been improved. They were, therefore, condemned as unfit for food and destroyed."

National Negro Health Week

In coöperation with this great movement to better the conditions of the negro, who is a big factor in public health progress in the South, Dallas instituted a series of meetings during the week of April 22, 1917.

Leaflets were distributed thruout the section chiefly populated by negroes, inviting all Dallas negroes to take part in the country-wide campaign for better health among their race. Statistics were quoted to show that one-half of the sickness among the negro race in Dallas could be prevented. Then followed an invitation to all to attend the churches on April 22 to hear the preachers talk on this topic and to go to the great Negro Health Meeting later in the week, where prominent Dallas negroes and representatives of the Health Department gave interesting talks.

Negro mothers were asked to bring their children to the baby conference on Friday, where city physicians and nurses gave group talks and individual instruction in the care of infants without any cost to those attending.

A special sanitary and health inspection was made thruout the negro quarter during the week, to discover and remedy any and all undesirable conditions that might prove detrimental to health. At the end of the leaflet mentioned above there was an earnest appeal to clean up yards and destroy breeding places for flies and mosquitoes, directed particularly to the negro citizen, whom it is absolutely necessary to bring into the fold of sanitary endeavor to enable the health authorities of cities having a large negro population to gain ground in the fight against preventable diseases. The leaflet

"BEFORE"

"AFTER"

The problem, and the results of a mosquito campaign carried on by the Dallas Department of Public Health

was signed by three organizations, the Colored Medical Association of Dallas, the Grand Lodge Colored Knights of Pythias and the Dallas City Health Department.

A Multitude of Other Activities

Particular interest was manifested by citizens of Dallas in the exhibit of the Health Department at the State Fair. This was due, in part, to the fact that few of the people realized just how the $110,000 budget of the department was expended. At the municipal exhibit the health authorities showed the extent of the activities being promoted, by means of charts, diagrams, models and photographs which not only presented the work of Dallas, but compared it with that of other cities.

The campaign against malaria has been pushed with success, in that hundreds of small breeding places of mosquitoes have been eliminated by the work of the Department, together with the aid of the people. A radical and effective ordinance was passed by the Board of Commissioners of the city giving the Health Department power to prosecute any person permitting the collection of standing or flowing water in which mosquitoes might breed, within 3,000 feet of the corporate limits of the city. The nature of standing water is well defined in the ordinance, and the nature of the many kinds of containers in which the water might collect are carefully described. Authority is granted to inspectors to enter premises in the execution of inspections under this ordinance, and a fine of $200 is imposed for conviction under each and every day's violation of the ordinance.

One of the sources of pride of the Health Department is the admission of Dallas as a registration city under the Federal Census Bureau. This is because the health records are accurate enough to be of value to the federal authorities, and is a distinct business asset to Dallas.

Perhaps one of the most important accomplishments of the Health Department during the last year has been the definite establishment in the minds of the taxpaying and business interests of the city of a full appreciation of the importance of organized health protection activities and of their practical economic and financial value to the

community. One of the best evidences of this is the appointment of the full-time secretary for the Committee on Public Health of the Chamber of Commerce, mentioned at the beginning of the article. Furthermore, in a recent communication from the President of the Chamber of Commerce to the War Department relative to the possible location of a mobilization camp near Dallas one of the principal arguments presented for locating the camp in this vicinity was the facilities provided by the city and county officials for maintaining satisfactory health conditions in this district.

A Replanning of the Street System of Southwest Philadelphia

MOST city planners are forced to concede that their chief occupation is replanning cities instead of actually providing plans for new municipalities. The problem in southwest Philadelphia is a mixture of the two, for there are some areas which have been untouched by development, and there are other areas which have been slightly built up, due to the rapid growth of the industrial colony between Chester and Philadelphia.

The General Proposition

The Permanent Committee on Comprehensive Plans has given special study to the development of the street system in the outlying sections of Philadelphia, with a view to avoiding that too rigid adherence to the "gridiron" plan which characterizes the older sections of the city. The committee's recommendations on which this article is based are now available in a pamphlet entitled "Report on the Revision and Extension of the Street System of Southwest Philadelphia."

The territory covered by the work embraces about 5,000 acres lying between the Schuylkill River, Darby Creek, and the Philadelphia, Baltimore & Washington Railroad south of Sixty-third Street. Of this area about 3,000 acres is below high tide and is protected by dykes. The general topography of the country under discussion is similar to the territory of the unimproved area to the south of the city for which plans have been prepared during the last three years, but owing to the improvements and buildings which have been constructed recently an entirely different treatment of the southwest territory is necessary.

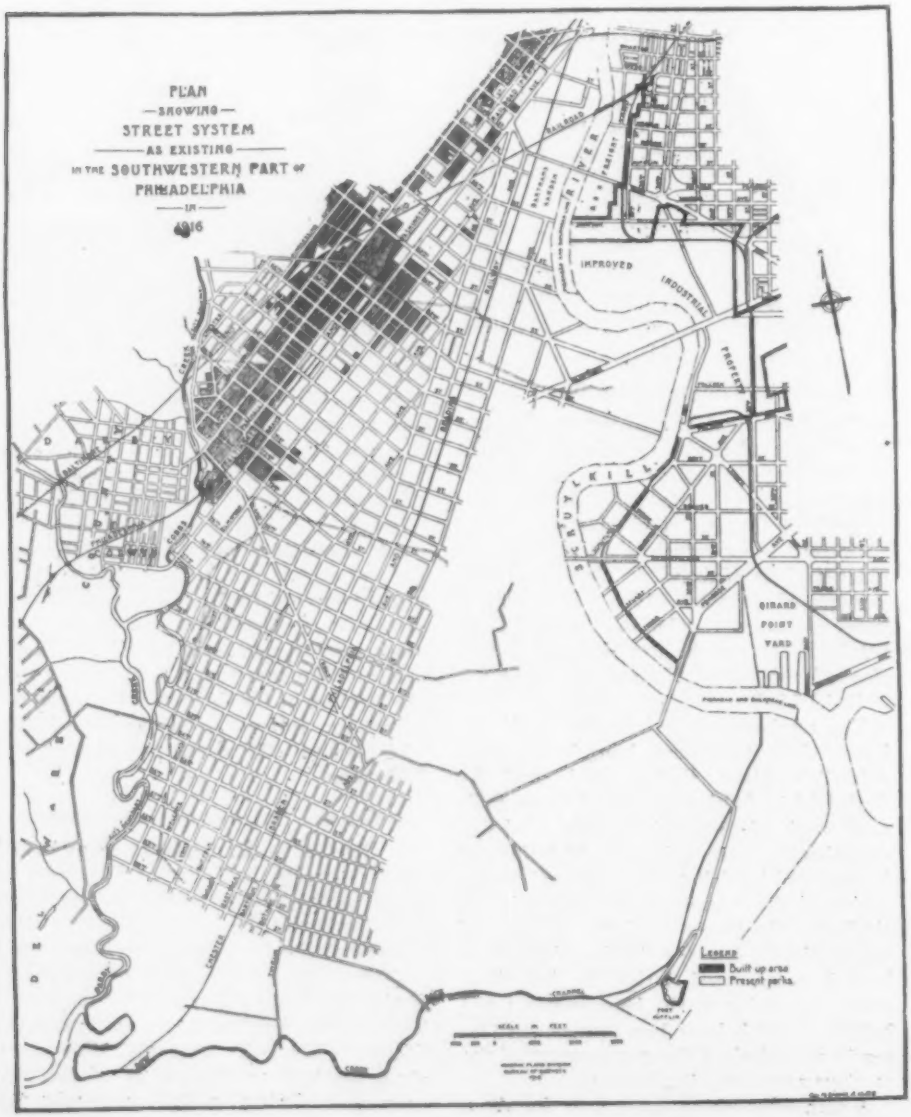
A plan establishing street lines for about one-half of the Southwest Philadelphia area was approved as early as 1855, and additions have been made to it as other parcels of land were put on the market. However, the drainage problem for the remaining section has checked any considerable development over the entire district. About 900 acres of the low territory have been developed by building associations and hundreds of substantial dwelling houses have sprung up. These dwellings conform to the street lines already laid out, but, due to the lack of an established grade, they have been constructed according to the natural contour of the land. A number of streets have been improved and surfaced with macadam or other material. To raise this entire area to provide natural drainage at this time would partly bury many of these buildings and necessitate the destruction of many of the improved roads. This would involve the city in vast suits for damages and for reconstruction and would check the development of an area which is now rising rapidly because of the demand for housing facilities for workmen from the great industrial plants in the vicinity of Chester and Eddystone.

General Purposes of the Revision

In October, 1916, an ordinance was passed which instructs the Board of Surveyors to revise grades, lay out streets and establish parks and generally improve the area with due respect for its present development and its future value. The decision regarding grades has been well settled by the establishing of the Southwest Sewage Treatment Works, which will treat and dispose of about one-half of the sewage of the city eventually. This plant does away with the

need of raising of the level of the entire area to provide natural drainage to the river. Hence, it will be possible now to establish grades which will conform to the elevations of the houses already built.

The construction of the sewage treatment works brings a new problem into the field, namely, the providing of streets wide enough to accommodate the large pipes which will be needed to convey the wastes to the works for disposal from the upper section of southwest Philadelphia. This problem was met in connection with the water-works plants constructed several years ago and many streets were found of insufficient width to carry the large conduits. The engineers designing the new sewage treatment works have already met this difficulty in southwest Philadelphia and have been forced to relocate the main lines of the outfall sewer. This has made it necessary to alter the plans for the street



system in the plan now under consideration to agree with the larger needs of the greater territory served by the sewage treatment works.

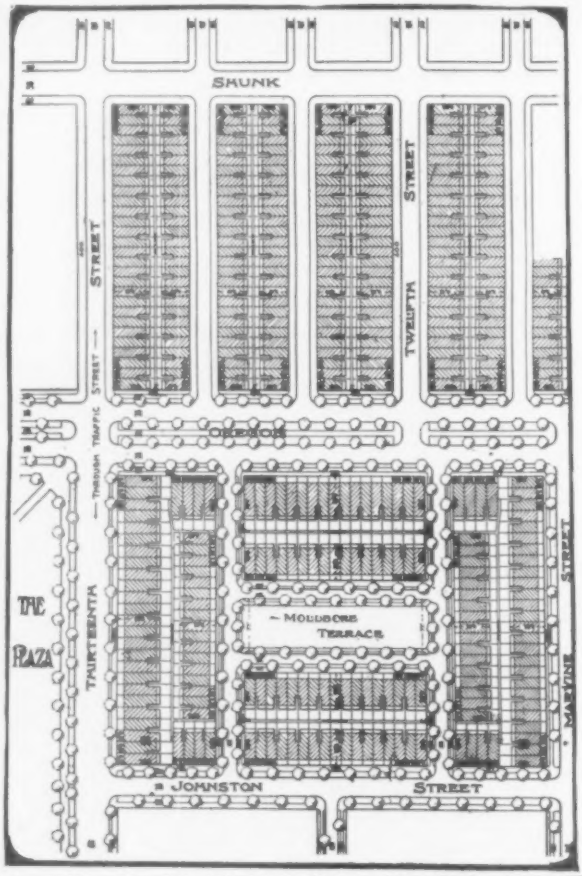
Transportation and Circulation

The facilities for general transportation and circulation are of primary importance. As this area lies immediately adjacent to great tidal rivers, between two rapidly growing industrial communities, and with a large suburban population further back from the rivers, direct and convenient routes for all classes of traffic, both local and thru, are essential to its proper and profitable development. The territory to be replanned is crossed by a freight-carrying railroad from northeast to southwest and connects with the river fronts in several places. The area from Bartrams Gardens to Chester, a distance of about ten miles and varying in width from one-half mile to two miles, will

probably be developed for industrial and commercial purposes. The rapid growth north from Chester promises to continue and forecasts well for the success of this development.

There is need of a scheme to separate the grades of the streets and the railroads. As the elevation of the railway tracks seems to be the simplest way to carry this into effect, this will probably be done. To carry the streets under the present tracks is not expedient, and to carry them over by bridges would entail needless expense in fill and bridges.

A marginal system of railroads is suggested with spur connections to reach the territory not located immediately on the water. There are three lines which would greatly benefit from this arrangement, as they now practically parallel each other. The river front line could connect with existing lines at Chester and Grays Ferry Avenue as well as with the new south Philadelphia yards by means of a river bridge, thus forming a continuous river front service for a distance of twenty-five miles along the river, with adequate connections.



SECTION SHOWING CONVENTIONAL TREATMENT OF BLOCK (ABOVE) AND PROPOSED PARK TREATMENT IN REVISED PLAN FOR SOUTHWEST PHILADELPHIA (BELOW)

The street railway problem is readily solved by the addition of a new line running thru the center of the district and paralleling the two existing lines. The present street railway service from Chester and Philadelphia is encouraging the growth of urban improvements.

The streets for the primary system will range from 70 feet to 248 feet in width, according to the need for the adequate handling of the local and long distance traffic as well as the need of locating sewers and subways within their lines.

The secondary system will be composed of streets from 70 to 88 feet in width, designed to form short cuts between the primary streets. Streets of these widths are adaptable for business uses and should become popular business streets in the future.

The treatment of the streets to provide a highway large enough for the needs of present and future traffic, but still not imposing a great strain on the finances of the community because of overdevelopment of the highway system, is interesting:

"A street 108 feet wide might ultimately require, and would have a roadway 72 feet wide, but such a width would probably be entirely unnecessary for traffic uses at the time of its original paving, or for many years thereafter, and the cost of laying that width of pavement and of maintaining it for an indefinite period would be an unwarranted expense. Great economy could be effected by placing a strip 20 or 32 feet wide, planted with grass, trees or shrubbery, along the center, with a roadway 20 or 26 feet wide on either side, these widths depending upon the probable immediate needs of traffic. The center strip could also be oc-

cupied by a street railway to much advantage, as general traffic would be kept off the tracks and much faster speed could be safely maintained; the 20-foot roadways could be widened with comparatively little expense at any time by setting back the curbs along the central strip. This arrangement would permit the side curbs and the trees along the sidewalks to be placed in their permanent locations."

Land Subdivision for Purposes of Development

Until quite recently property in southwest Philadelphia has been subdivided for improvement purposes on the basis of lots from 25 to 50 feet wide and 100 feet and upwards in depth. This arrangement has produced detached and semi-detached dwellings on many streets, but the entrance of the trolley system has brought about a more intensive development, due to increased property values. Property is now being subdivided into many smaller lots, with the result that there are rows of two-story, 14-foot front houses being erected. It is this intensive development that the southern Philadelphia planning was designed to check, and the same idea will be carried on in this southwestern section. It is aimed to obtain lots of approximately 60 feet front and thereby put an end to the undue crowding of the houses.

Extension of the Park System

There are but two parks in the entire southwest section at the present time, Bartram's Gardens and Connell Park. The revision ordinance contains authority for the establishing of parks as they may become necessary. The committee has taken full advantage of this authority and has established a general system of small parks for recreational purposes.

There are but few tracts in the area which lend themselves readily to treatment as parks, but where there are woodland lots and other places which do show that they may be easily converted, they are eagerly seized for recreational areas.

Park and playground sites should be located near schools; but as these have not been located as yet, it is impossible to make any definite choice in this manner. However, it is hoped that the idea will take the opposite turn this time and that the schools will be placed near the recreation grounds.

Conclusions

This entire work will be carried on with practically no expense to the city except the cost of preparing the plans. These, however, will be made as a part of the routine work of the office and hence not subject to extra charges. No liability for damages to property will be assumed by the city until ordinances are passed for actually laying out the streets and parks. The dedication of the wider streets can scarcely be expected, as they are of general public benefit; but they should be dedicated in part because of the actual benefit to the adjacent locality. No ordinance permits this at present; but it is hoped that this may be overcome shortly, as it has been in practically all parts of the United States outside of Pennsylvania.

The revision of the section as suggested will be in effect an extension of the park and street system of south Philadelphia, and the two will be connected with that section by bridges across the Schuylkill on the primary highways. This means the official establishing by a city of "a comprehensive plan for controlling the growth of the city over an area of about 10,000 acres, with forethought for the orderly and progressive development of expanding urban activities."

In order fully and successfully to carry out the provisions in the suggested plan, it will be necessary to secure the coöperation of the officials of boroughs and townships lying in close proximity to the boundaries of Philadelphia. To this end an act is being sought in the State Legislature, granting powers to cities of the first class over the planning of areas within three miles of the borders of the city. This privilege is now enjoyed by cities of the third class, and to permit the proper planning of metropolitan areas an act giving these powers to cities of the first class is very essential.

Reconstruction and Rehabilitation Work in Europe

By Bernard J. Newman

Director of the Pennsylvania School for Social Service, Philadelphia

VARIOUS plans are being projected in the United States to organize units for reconstruction work in the devastated areas of Europe. Already English Friends have been doing some such work in France and Belgium and have sent a few workers into Russia. The English and Belgian town planners, housing engineers, architects and builders have been holding conferences and conducting lecture courses in order to prepare for activities on a large and scientific scale when the war is over. The Belgian Government has promulgated a law requiring reconstruction work to be planned, and such plans to be approved by the government before actual operations are begun. Holland and England have town planning laws governing the opening of new areas. France is now enacting similar legislation.

The sum total of what has been done for devastated districts so far consists of preparatory legislation, some educational work, a little housing, some farming and restocking, and a mass of relief. The rehousing has been in a type of building hardly justified except to tide over a serious house famine; the buildings themselves, if allowed to be permanently occupied, are of a type to get into early disrepair and develop into slums. The relief work has been primarily of an emergency character, and apparently proceeds only slowly with real family rehabilitation.

With the advent of the United States in the war and the emotional awakening of this country to the enormous sacrifices forced upon certain districts of the Entente Allies there has come a desire to take part in the work of reconstruction and rehabilitation. The Red Cross is formulating plans, the American Friends have already organized a unit and have another in contemplation, while other groups are calling for funds for similar work. The consequences that may follow this newly awakened interest may be serious if the plans formulated are not carefully thought out. The problems presented by such districts which seem so simple to the layman really call for the services of the highly specialized city planners, housing engineers, sanitarians, construction engineers and builders, social case workers and other specialists either in physical reconstruction or in family rehabilitation.

Briefly stated, the situation is one where areas have been devastated, families have been driven from their homes entirely or have improvised habitations, some in cellars and some in portions of the old houses left standing. In sections unharmed by the invaders, homes have been overcrowded and problems of occupancy have increased, and with them problems of disease—pneumonia, tuberculosis and other ills of a contagious character. With the men in the army, with school studies interrupted and with inadequate provisions for play for children, problems of child care and discipline have also increased. In like manner industry has been disturbed, the tillage of the soil interfered with, and in some sections the land has been so torn up and charged with unexploded shells that it is doubtful if it will ever again be serviceable for tillage. The estimated cost of the material damage alone done in northern France has been placed at 15,000,000,000 francs. Any reconstruction and rehabilitation work, to be of more than transient character and to safeguard against the development of other and serious problems which will hold over long after the war is past, calls for a definite and scientifically worked out program.

France has recognized this and it is alleged has asked that whatever is done be of such a character as not to break down the self-reliance of the people of the areas helped. This means that the program adopted must comprehend in scope the various elements that enter into normal life and must utilize the community resources that may be present in the areas where the service is rendered or, these lacking, must create the needed resources. Moreover, the program must be so shaped that it will

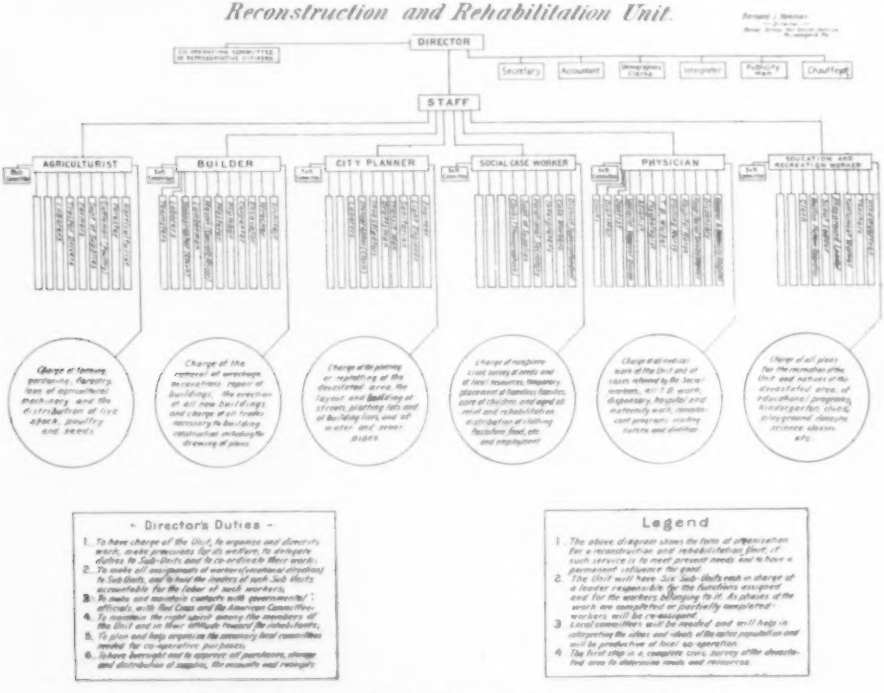
utilize the resources of the persons to be helped to the fullest extent, supplementing such only when necessary to give the family a start on the road to self help. The scope of the program for each service is given in the accompanying organization chart.

The Need for Comprehensive Plans

Obviously in an area where there is destruction of property on an extensive scale, normal life is broken down. Where dwellings are destroyed home life is disrupted and families are separated. Where war has devastated, production has been reduced, whether of foodstuffs from the farm or machine goods from the factories. Here, then, are three essentials to family welfare that are thrown into an abnormal condition. A return in so far as it is possible to normal conditions is necessary. Until this return is effected whatever is done is temporary; and in temporary plans, arranged not to meet the broad problem, but only a phase of it, there is danger of disturbing for indefinite periods the normal balance. The catastrophe has thrown, for the time being, this balance out of order. Plans directed to meet only one phase of this disorder are bound to prolong the disorder of the whole. This is patent to anyone who has analyzed the poor relief work of the past four centuries. It applies equally to the work done for the victims in the areas of devastation.

Any plan that stops with the opening of warehouses and the apportioning of food or clothing has a limited value. It serves a need, but does not so serve without a grave risk of rendering an improperly balanced service. Safeguarded, it is, of course, better than nothing, and in the first stages of recovery from an acute crisis such relief may be the only feasible thing to give; the crisis past, it is insufficient. For rarely does destitution such as has befallen thousands of French and Belgians show itself without bringing with it other problems besides the need for food and clothing. These added problems arise from the lowered vitality due to unwholesome and abnormal living conditions. Any cataclysmic disturbance of normal life presents its physical reaction in the

Reconstruction and Rehabilitation Unit.



ORGANIZATION CHART FOR REHABILITATION WORK

form of sickness of a contagious nature, such as tuberculosis, or mental distress or moral laxity. These must be recognized and resources created to help to meet them. Hence the need of the health service, the hospital dispensary, the hospital social service department, the nurse and like facilities and workers to handle the problems of sickness that have developed and to help establish a prophylaxis to reduce their virulence and to prevent their spread.

Resources also have to be made available for the task of stabilizing education for those of a school age and for bringing back a hopeful habit of thought about life thru the introduction of plans for the wholesome use of leisure time, meeting the need of the adult for recreation and, more important still, meeting the problems of child delinquency by filling the child's mind and time with thoughts and play that crowd out the plans and practices of unsupervised effort that lead to delinquency.

Helping the People to Help Themselves

Bearing in mind the conditions existent, it is evident that the people cannot be restored to their normal ways until they themselves begin to take part in the production of food supplies thru the tillage of their farms and thru their placement in industries or in gainful occupations. Thru such methods there is a quick return to economic living, giving the strong the opportunity for self-help and furnishing a most effective resource for aiding the weak also to get back to the point of self-help.

Equally important and equally apt to be lost sight of in the emphasis on the self-evident things to do, are the fundamental needs for physical reconstruction. Just as in planning for the needs of the body, the novice thinks solely of food and clothing, so often in planning for physical reconstruction the idea uppermost is to provide houses to shelter the homeless. The type of building adopted is almost invariably the factory-made house. Where the houses are placed and how arranged and their particular adaptibility to the community life are after thoughts usually, if thought out at all. Yet city planning principles must be applied to all reconstruction work, if the latter is to be at all satisfactory, and especially in the areas where devastation has been the most severe. There is desire for a duplication of the picturesqueness of the old Belgian and French towns and cities, but such picturesqueness often was at the expense of sanitation. The artistic need not be sacrificed in the new; that is not the alternative. The essence of true city planning is the combination of utility with beauty, not only in the convenience of the layout, but in the opportunities for ample light, ventilation and drainage with a minimum of congestion of population and traffic and a maximum of architectural strength and artistic construction. Naturally all such planning carries with it engineering problems noted in the organization chart. Such features must be included, for the result produced by American money and American skill should not be a monument to incompetency, such as has been the product of San Francisco's reconstruction or of the relief of Messina. Rather should it be a monument to the foresight and ability of the American people as well as to their humanity.

It is unnecessary to point out the relationship of the various phases of the work required. The organization chart depicts such. With the characteristic procedure of the novice in social or philanthropic work, there is danger that those who organize units of service abroad may each plan to meet only one phase of the work needed to be done. It is a mistake to have one group interested in the medical side, another in food distribution, a third in house construction and so on thru all the phases of need existent. The segregating of functions always multiplies agencies, increases friction, develops red tape, produces delay and increases the cost of operation thru duplicating overhead charges. Efficient results come thru coördinate service under centralized management in civic and social work, just as in industrial production. The problems of a devastated area can be met by the form of unit here outlined, utilizing local resources from the area of work itself and supplementing by the organization and transportation to the same area of sub-units equipped to provide for the resources that are there lacking.

The Central Committee and Its Personnel

It is almost a trite statement, and would be wholly so were it not observed more in the breaking than in the keeping, to say that economy and efficiency dictate that all such

units, wherever at work and under whatever management, should be directed by one central committee. Such a committee can obtain supplies and direct transportation with the cost reduction that follows wholesale purchases and production, as well as with the authority that can require the adoption of plans proven successful in one area for work being done in another area where similar conditions prevail.

Of equal importance to the right plan in reconstruction and rehabilitation work is that the personnel to carry it out should be qualified for the work they will have to render. Because the field of labor is 3,000 miles away and the funds used are the free offerings of the charitably inclined, it is all the more important that those who are to carry out the work should be qualified for what they are expected to do. A program such as is outlined here, either in whole or in part, requires the executive direction of specialists who have had technical training and practical experience and who do not attempt to get such in a six-weeks' course of lectures before they start, nor who think they can get the necessary information from books which they read while on their way over.

This is so self-evident as to raise the question as to the need for emphasizing it. Ordinarily it would not be necessary to give it such emphasis, but in war time the pressure to get things started often forces unwise leadership justified by the thought that, with the right program or some program and native qualifications, the lack of experience will only delay but not handicap the results. Such a decision is unbusiness-like and certainly inefficient and is conducive to mistakes. It is hard to conceive of a banker as a professional town planner; or of a physician in regular practice of his profession as a housing engineer; or even of a private nurse who has spent her time at the bedside of the sick as able to undertake the intricate tasks of the social case worker. It is not a criticism of any of the professions to say that, while the individuals may be trained for their own line, they are not equipped for the new fields for which they have had no training and for which they are no more qualified than any other novice. In the vocational selection of the personnel of commissions and directors of units, just such misplacements are often made and will continue to be made unless the fact is kept clearly in view that for technical work technically trained and experienced workers alone are fitted for leadership.

Not only, therefore, must the right plans for reconstruction and rehabilitation be made, but vocational functioning must also be resorted to for directing and carrying them out. The adaptation of such plans to a particular locality can only be determined after a complete civic and social survey has been made by investigators working under such specialists. Only then can the real needs of the devastated district, and not simply the perfectly obvious ones, be satisfactorily met, and the local resources be utilized to the limit of self-help.

The Water System of Meadville, Pa.

By Harry Ellsworth,
Superintendent, Water and Light Department, Meadville, Pa.

THE Meadville water system was purchased from a private company many years ago after long and expensive litigation. At that time French Creek, the source of supply, had become contaminated, and steps were immediately taken to find a new one. Engineers were employed to make an investigation and to furnish plans for a complete new plant. Their preliminary investigation was extremely thoro. Numerous test wells were put down, and after exhaustive tests and study of the geological conditions, a site was selected about two miles from the city.

The formation at this location was found to consist of a modified glacial drift from 200 to 300 feet deep, having a water-bearing area of about 10 square miles, receiving the drainage of an area of 80 square miles.

The water is taken from 25 wells drilled in a line at right angles to and intercepting the flow down the valley. The wells are

cased off with 5⅝-inch casing and average 60 feet in depth. The water level is at all times within reach of the main pumps without resorting to deep-well pumping appliances of any kind. On the bottom of each well pipe is a brass strainer with 2,600 slots so fine that there is no possibility of even the finest sand coming thru. Wherever excavations or drillings have been made in the vicinity of the wells, a stratum of pure clay from 6 to 10 feet in thickness, which is impervious to surface contamination, has been encountered at a depth of about 6 feet.

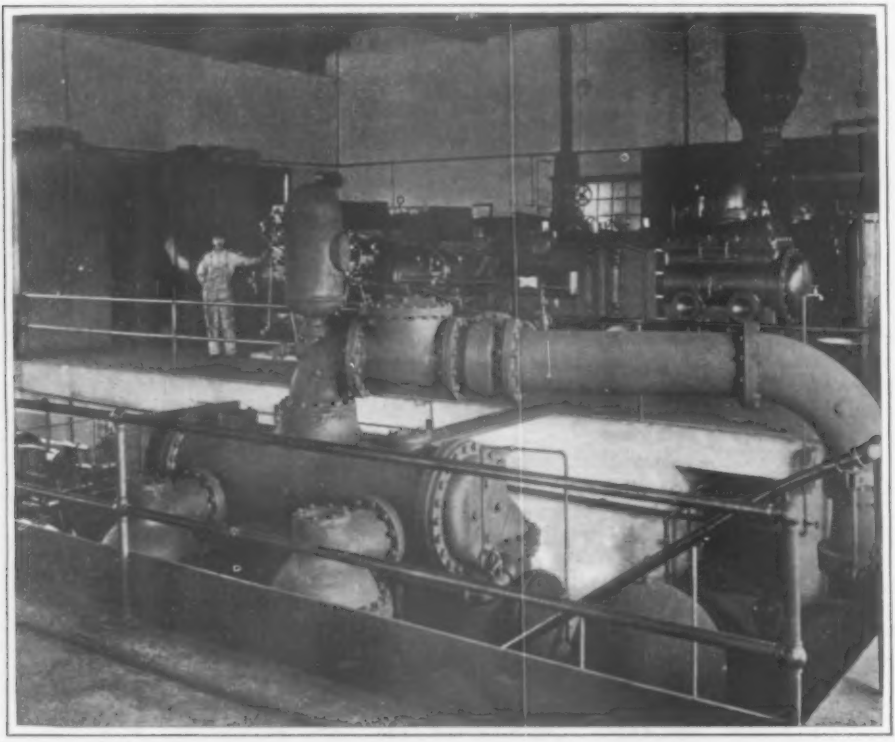
The pumping equipment is in duplicate, and each unit has a capacity greatly in excess of the daily consumption. The pumps are modern in every respect, one a Worthington triple expansion with high duty-compensating cylinders, with a capacity of 4,000,000 gallons, and an Epping-Carpenter triple expansion of 3,000,000 gallons.

The elevation and capacity of the reservoir are such that unusually good fire protection is provided. The pressure in the business part of the city is 115 pounds. Tests made by the Underwriters Association show that a pressure of 87 pounds can be maintained while operating twelve 2½-inch fire streams with 1-inch nozzles.

Water rates in Meadville are low. For domestic service 15, 10 and 5 cents per hundred cubic feet is charged, and 5 cents per hundred for manufacturing. All services are metered, including those for city purposes. The water system is self-supporting, operating expenses, interest and sinking fund charges being paid entirely from water receipts, and also all pipe laying without assessments against abutting property.

The bonded debt is $25,000, payable in 1918, when the money will be available.

Bacteriologically the water is almost perfect. Tests are made weekly. The bacteria count often is as low as 2 and never over 50, with no trace of colon bacilli. This the city is provided with a safe drinking water without recourse to sterilization.



INTERIOR OF THE WATER AND LIGHT PLANT IN MEADVILLE

Chloramine for Water Sterilization

Its Use in a Water-Works Plant and a Swimming Pool

(Chloramine, a chemical compound, is formed when dilute hypochlorite and ammonia are mixed)

By Joseph Race

City Bacteriologist and Chemist, Ottawa, Ontario

IN these days of increasingly high prices for chemicals which are needed for the sterilization of water supplies any means which reduce the costs or quantities of chemicals are welcome to both municipalities and water-works superintendents.

Rideal, in 1910, was the first to note the strong germicidal properties of chloramine, and attributed to it the persistent sterilizing action that has been observed frequently when hypochlorites are added to sewage. A search of available literature for work on chloramine showed that Rideal had previously prepared this substance by the addition of a solution of ammonia to sodium hypochlorite, and that he had found this procedure to increase the germicidal action of the hypochlorite 300 per cent. The author confirmed this method of preparation and also found that a similar action takes place upon the addition of ammonia to solutions of ordinary bleaching powder. At this time the discovery appeared to be only of scientific interest, and especially so inasmuch as Rideal had attributed the obnoxious tastes and odors sometimes caused by chlorination to the formation of chloramines.

During the winter of 1915-1916 the price of bleach advanced to such abnormal heights that the writer determined to try out the process on a practical scale for the purification of water. A subsidiary plant at Ottawa, pumping about 200,000 Imp. gallons (240,000 U. S. gallons) of water per day, was available, and the chloramine process was substituted for the use of bleaching powder. This new process was begun by adding pure ammonia to the bleach solutions contained in barrels. The results were not satisfactory, and it was found that the bleach solutions as analyzed were far below the strength expected. This was confirmed on subsequent days, and the deficiency was found to increase with increasing amounts of ammonia. Alterations were made in the plant, and the bleach solution and ammonia were prepared in dilute solutions in separate vessels and allowed to mix for only a few seconds before delivery to the suction of the pumps.

This method of application was successful, and results equal to those obtained in the laboratory were secured. The dosage was reduced until the bacteriological results were adversely affected, and continued at values slightly in excess of this figure for some time to prove that the process was reliable. Theoretical considerations indicated that the most efficient proportions of available chlorine and ammonia would be approximately one pound of ordinary bleach to one-half pound of aqua ammonia. The results in practice confirmed these ratios for the water under consideration, but it is possible that with other waters a slightly higher ratio of chlorine to ammonia might be used with advantage. Higher proportions of ammonia were tried, but the slightly increased efficiency produced was not commensurate with the increased cost. The results obtained on the experimental plant, together with those from the main plant, where 20 million Imp. gallons (24 million U. S. gallons) were treated with straight bleach solution, are given in the following tables. The two periods given are for those immediately preceding and following the spring flood period; these represent the best and worst water periods.

The cost data are calculated on recent spot prices for bleach and aqua ammonia (26° B.) in the United States, but if the prevailing Canadian prices are substituted, the chloramine process shows an even greater economy.

During February of 1917 a further increase in the price of bleach gave an opportunity of trying the process on the main plant, which has a capacity of 20 million Imp. gallons (24 million U. S. gallons). The ammonia used in this instance was

COMPARISON OF HYPOCHLORITE AND CHLORAMINE TREATMENT
BACTERIOLOGICAL RESULTS

1916	RAW WATER			TREATED WITH HYPOCHLORITE ALONE				TREATED WITH HYPOCHLORITE AND AMMONIA				
	BACTERIA PER C.C.		B. COLI INDEX PER 100 C.C.	BACTERIA PER C.C.		B. COLI INDEX PER 100 C.C.	AVAILABLE CHLORINE P.P.M.	BACTERIA PER C.C.		B. COLI INDEX PER 100 C.C.	AVAILABLE CHLORINE P.P.M.	AMMONIA P.P.M.
	AGAR 1 DAY AT 37°C.	AGAR 3 DAYS AT 20°C.		AGAR 1 DAY AT 37°C.	AGAR 3 DAYS AT 20°C.			AGAR 1 DAY AT 37°C.	AGAR 3 DAYS AT 20°C.			
MAR. 15-31	44	238	35.7	4	12	0.14	0.90	4	12	0.14	0.22	0.11
APR. 1-19	3,099	14,408	195.5	32	56	0.50	1.10	33	246	0.74	0.25	0.13

	COST PER MILLION IMPERIAL GALLONS		COST PER MILLION U.S. GALLONS	
	HYPOCHLORITE ALONE	HYPOCHLORITE AND AMMONIA	HYPOCHLORITE ALONE	HYPOCHLORITE AND AMMONIA
MAR. 15-31	$1.12	$0.46	$0.93	$0.384
APR. 1-19	$1.26	$0.54	$1.05	$0.450

Calculated on Bleach at $3.80 per 100 lbs. and Ammonia (26°B) at 5 ¾ cents per lb.

commercial aqua ammonia (26° B.). The method of application was the same as had been found satisfactory at the experimental plant, and the bleach dosage was gradually reduced as the ammonia was increased. The dosage was checked and controlled by the usual starch iodide reaction, which is given by chloramine as well as chlorine, at the plant and in the laboratories of the Health Department and also by frequent bacteriological examinations.

At the time of writing, the amount of bleach added has been reduced by over 60 per cent, and the total cost of material is now about $16 per day less than that of straight bleach treatment when calculated on prevailing values and last year's average dosage. The high dosage required with straight hypochlorite treatment is necessitated by the high organic content of the Ottawa River water, and it has been the experience of Hull, which takes its supply from the same river at approximately the same place, that a minimum of 0.7 parts per million of chlorine are required even when liquid chlorine is used.

Up to the present no complaints have been received regarding tastes and odors. Chloramine, when prepared in the pure condition, possesses a strong, pungent odor, but the minute traces that are required for the sterilization of water cannot be detected by the senses.

Another example of the efficiency of the chloramine process was noted during a series of experiments on the disinfection of the water of a swimming pool at the Ottawa Y. M. C. A. This pool was being extensively used by the various military units stationed in Ottawa in addition to the members of the association, and it was found that very frequent changes of water were necessary in order to avoid complaints. The cost of raising the temperature of the water 20 to 25 degrees Fahrenheit quickly became a serious financial consideration, and the author was requested to suggest a method of disinfection which would enable the water to be retained at least seven days. Hypochlorite was first used, but even with as high as three parts per million of available chlorine, aftergrowths rapidly occurred and total bacterial counts of 50,000 to 100,000 were repeatedly found; the B. coli index was usually 2 to 5 per c. cm. Hypochlorite treatment at this dosage was a total failure, and it was deemed undesirable to use larger amounts on account of the tendency to cause irritation of mucous membranes.

Chloramine treatment was next used, and after the attendant had become thoroly conversant with the proper method of application very satisfactory results were obtained. The treatment finally adopted was 1 part per million of chlorine with 0.5 parts per million of ammonia, and this, when conscientiously carried out, produced a water containing less than 100 bacteria per c. cm. and free from B. coli in 10 c. cms. The elimination of the aftergrowths by the chloramine process is due to the non-absorption of the germicide, so that all of the added substances are available for the destruction of bacteria.

With waters that absorb but little chlorine the relative efficiency of chloramine would probably be lower than with waters containing appreciable quantities of organic matter, and for the same reason the process should be admirably suitable for the treatment of sewage and sewage effluents with comparatively long contact periods.

The increased efficiency obtained by the addition of ammonia to hypochlorite naturally suggests a similar mixture with liquid or pure chlorine, but the efforts of the author in this direction have not yet yielded results worthy of publication. The

difficulty apparently lies in the non-production of hypochlorous acid by pure chlorine and water, and the consequent inability to form chloramine. New conditions may, however, be found that would direct the reaction along these lines.

The chloramine method of water and sewage treatment which has been described is the outcome of some experiments made with a view to placing chlorination on a scientific basis, and this particular development can to some extent be regarded as accidental. It illustrates, however, the value of research work in every field of science and exemplifies a portion of a recent address by Willis R. Whitney:

"Through all I see the same interesting fact. It is the desired unforeseen which frequently eventuates, and our constant need is for faith that this will happen again. The regularity with which we conclude that further advances in a particular field are improbable seems equalled only by the regularity with which events prove that we are of too limited vision. . . ."

The Use of Ultra Violet Rays in Sterilizing Water

METHODS of sterilizing drinking water have made very rapid advance within the last few decades. Slow sand filtration was accepted twenty-five years ago as the means of removing practically all the bacteria from polluted water, thus making it reasonably safe for domestic consumption. When it was found that sand filters were not always perfectly reliable, and that a very constant watch had to be maintained over their operation, other means of providing a safe drinking water were sought. Dr. Rivas suggested the use of ozone as a finishing process, and referred to it as a "means of bringing the system of slow sand filtration to perfection." The excessive costs of operating an ozoning plant militated against its general acceptance in this country, altho there are many plants operating successfully in Europe.

Chloride of lime, or hypochlorite, sounded the death knell of the ozone process about 1908, when the experiments of George A. Johnson in the use of this chemical on the waters of Bubbly Creek, Chicago, led to the first practical use of hypochlorite for water sterilization. After the general acceptance of hypochlorite or bleach as a sterilizing agent, it was found that in addition to its corrosive properties, which caused it to destroy practically all metals in the store rooms and greatly irritate the mucous membranes of the workers, there were in many cases tastes left in the water after a sufficient amount of the chemical had been added to properly sterilize it.

The next step in practical water sterilization was the introduction of liquid chlorine, the first known reference to its use being in the November, 1911, issue of the *Journal* of the American Public Health Association, by Major Darnell, U. S. A. This means of sterilizing water was soon commercialized, and has become one of the most common methods of treating clear, but polluted waters which have not a great amount of organic matter. The apparatus is inexpensive, compact, practically automatic in operation, and readily set up in existing buildings. There is the same objection as that voiced against the use of bleach, namely, that there may be a taste left in certain waters which require the use of an exceptionally large amount of the gas to prevent the development of spore-bearing bacteria in the water mains. In such waters, where the amount applied has been kept below the limit where the taste was readily noticed by waterworks analysts, it was found that gas-forming bacteria developed, while if a sufficient amount was used to check this the taste was objectionable to consumers. This is not due to the method of application, but simply to the nature of the gas itself and of the waters treated. It is a real problem in only a small per cent of the cases where liquid chlorine has been installed.

The European War has sent the prices of bleach soaring to great heights, which has materially aided in the development of the use of liquid chlorine, so that at the present time it practically dominates the water sterilization field.

Light as a Sterilizing Agent

The use of light as a sterilizing agent is not new, but dates back to 1878, when Downs and Blunt discovered that the shorter wave lengths of light were the most effective rays of the spectrum in destroying bacteria. The research work of Recklinghausen and others at Sorbonne University, Paris, is the chief source of present-day knowledge of ultra violet light. This work, in artificially producing ultra violet rays more profusely than before, led to their use as bactericidal agents.

In the early history of ultra violet ray sterilizers there were several types of lamps in use, but they have given way to a single type which has produced a richer field of rays and has operated more economically. The present lamp is a quartz tube containing a small reservoir of mercury and the platinum wire connectors which provide the current from either 110 or 220 volt circuits. The quartz tube is used because glass is practically impervious to ultra violet rays. In manufacturing the lamp, the mercury is sealed into the tube after a vacuum has been created. This is difficult, because of the difference in the coefficients of expansion of the quartz and the platinum wires. To overcome this, the quartz is gradually alloyed with glass until at the end the quartz content is no more than in ordinary glass. This permits a perfect seal, due to the similarity in the coefficients of the glass and platinum.

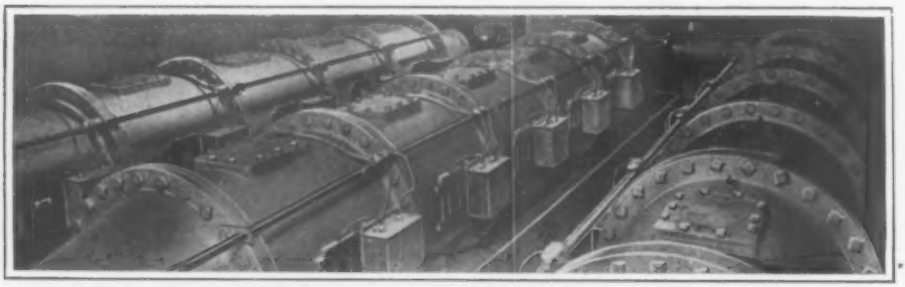
The method of starting the lamp is to tip it to a horizontal position until the mercury forms a contact between the anode and cathode; then, on breaking this connection, a small part of the mercury is vaporized and forms the mode of production of the ultra violet rays. In operation, the lamps are in a tilted position and mercury is constantly being vaporized and condensed. The lamps are started by either manual or automatic control, the latter being preferred because of its uniform action.

Altho the development of ultra violet light for the sterilization of municipal water supplies in this country has been slow, there are several plants in successful operation in Europe, notably those at Luneville, France, and Monte Carlo, each of which sterilizes 2,000,000 gallons daily. In the United States there is a 3,000,000-gallon plant located at Henderson, Ky.

Operating Methods and Costs

Municipal installations may be operated either as pressure or gravity sterilizers. In the first the water passes thru one or more cast iron mains into which the lamps are inserted, and the water passing thru encounters baffles which cause every drop to pass several times thru the intense fields of light. It has been the practice to install five lamps for each million gallons of water to be sterilized per day, but this allows a very large factor of safety which may be reduced without endangering the bactericidal action on the water. The second, or gravity, type of sterilizer acts as the water passes thru a long channel of concrete or other material and is baffled similar to the pressure type. There is no advantage in this latter method of sterilizing in an open trough, except that it is very attractive and entertains visitors. The pressure type is safer, as it does not permit the water to become contaminated in any way.

In installing an ultra violet sterilizer, there are two places which are more feas-



PRESSURE TYPE ULTRA VIOLET LIGHT STERILIZER, HENDERSON, KY.

ible than others. It must be understood that this method of sterilizing is not successful unless the water is free from turbidity and color; therefore such a water must be sterilized after filtration. Because of this necessity the lamps are usually applied either in the effluent main from the filters or else in the force main from the clear well, where it will be sterilized after passing the pumps and when on its way to the city.

The cost of sterilization by light will militate against its general installation unless electric current is very cheap. If, however, a city has a municipally owned electric light plant, the extra current which must be furnished—about 30 kilowatts per million gallons of water treated—is a constant load and therefore very acceptable to the plant. Further, if the electric light and water plant is operated by non-condensing engines, there is a fine opportunity afforded to install turbines operating on the waste steam, which will provide more than enough power in most cases for the entire operation of the extra generators to provide current for the sterilizing plant.

At the time the writer visited the plant at Luneville, France, in 1914, it was stated that the cost of sterilizing 2,000,000 gallons per day with all twelve lamps in operation was $4.50 per million gallons. In the latest available data from Henderson, Ky., with current provided by the municipal electric light plant at about one cent per kilowatt hour, the cost using fifteen lamps is stated to be 88 cents per million gallons.

The efficiency of the ultra violet treatment is very high. The following figures are quoted from tests carried on recently at the municipal installation at Henderson, Ky.:

Source of Sample	Total No. of Samples	Total Bacteria Per c. c. 24 hr. Incubation Average Count	Total B. Coli Per c. c. 48 hr. Incubation Average Count
Raw water	25	85,000	276
Coagulated	25	720	45
Filtered	70	80	0.35
After light treatment	54	0.31	0
City tap water	34	0.39	0

The present development of the industry in the light of the new standards of purity for water established by the U. S. Treasury Department for interstate traffic is of great interest. It is found that, altho there are many cities among those affected by these regulations with supplies that are considered as excellent, there are many in the group that do not measure up to the Treasury standard. The essence of the standard from the bacteriological standpoint is that the presence of more than 2 B. coli per 100 cubic centimeters of water indicates that it is not sufficiently purified to be a safe drinking water. It is claimed by the manufacturers of ultra violet ray sterilizers that water sterilized by ultra violet rays always passes this test, and it is known from unofficial tests carried on some years ago with the less efficient lamps then in use that B. coli are about the first organisms to be destroyed by the rays. In one particular instance, when a sterilizer was operated at the usual rate and the water was artificially polluted with B. coli, there were 35,000 of these organisms per cubic centimeter in the untreated water, and none in the water after it had passed thru the field of the lamps. After-growths in the pipes are entirely eliminated by the light treatment; as there is no chemical added to the water, no taste is introduced; and as the water is not heated in any way, it does not lose its palatable flavor.

That there may be an opening in the municipal field for this method of sterilizing water, in spite of its seeming expense, is evidenced by the ever-increasing demands by public health authorities that the health of the citizens be protected in every manner possible. It is not a long call to the day when the "old oaken bucket" was good enough for anyone, but to-day the demand is for an increasingly higher standard of bacterial purity for municipal drinking water.

Water Company's Charges

Under the water company's franchise which merely provides specific flat and meter rates for water service, the company is not entitled to impose a monthly meter rental against consumers, and a contract by a consumer to pay such rental, coerced thru refusal of the company to furnish a meter in the absence of such agreement, is invalid. (Texas Court of Civil Appeals, Green vs. San Antonio Water Supply Co., 193 Southwestern Reporter, 453.)

REVENUES – EXPENDITURES – BORROWING – PURCHASING

MUNICIPAL FINANCE

ACCOUNTING — AUDITING — BUDGET MAKING

The articles appearing in this department from month to month are prepared by the New York Bureau of Municipal Research. The following subjects will be covered during 1917:

The Problem of Additional Sources of City Revenue
Aids to Efficient Buying
The City Budget as a Basis for Administration
How to Save Five Million Dollars a Year by Merely Changing Some Tax Dates
An Efficient Bureau of Water Revenues
Auditing and Accounting Control of License Revenues
Assessing for Local Improvements
Serial Bonds versus Sinking Fund Bonds
Recording and Paying Claims
Stores' Accounts and Storekeeping
Payrolls—Preparation, Certification, Audit and Payment
Unit and Job Costs a Necessity for Good Administration

The High Cost of Municipal Stores Accounting

By E. M. Freeland

Stores Administration Not a Separate Problem

STOREKEEPING is but one process in the job of equipping and supplying a department. Unless the maintenance of stores is thus subordinated and integrated, and unless its relation to the general problem is kept constantly in the mind of the administrator, storekeeping inevitably becomes extravagant in spite of efforts at economy within the store itself. There is a strong temptation to regard the departmental store as an established institution which must be maintained and whose cost is to be regarded as one of the departmental "fixed charges." The storekeeper himself is helpless so far as major economies are concerned, and other officials care nothing for the burden they may place upon him.

There are few instances in city government where stores are controlled by an official whose job is the provisioning and munitioning of the departmental army. Generally, the first and only unifying and coordinating administrator is the head of the department. He, of course, has other jobs, and in civil government the supplying and equipping function practically never attains a separate identity. Property administration is always negative and never the positive, constructive, technical job it should be.

The Cost of Stores Accounting

Stores accounting is a part of the cost of storekeeping, and accounting for stores —like the custody of stores—is not at all proportionate in cost to the value of the store to the department. Strictly speaking, stores accounting is merely a branch of applied mathematics, and it may be elaborated to any degree of detail and exactness, with absolutely no reference to the value of the subject matter. Much of the blame now visited upon the accountant because "his system costs more than it is worth" belongs to him only upon the assumption that he is or should be—both in his attitude of mind and in the authority vested in him —an administrator. Whether this demand be right or wrong, its existence should be more thoroly realized by both the accountant and his employer. If the accountant accepts the dual responsibility, he should give his first and independent thought to the

administrative problem and, before he begins his work as accountant, should lay down for himself restrictions to govern his accounting work. Also the department or business head should be no less particular to so define the accountant's duties.

Stores Records Should Be Independent

Stores accounting is expensive, not only because it is often unjustified by the worth of the subject matter, but also because it is so frequently required to bear a large part of the burden of expense or cost accounting as well. Stores accounting is a species of asset and fidelity accounting. Data as to the consumption or application of articles issued from stores can be obtained from stores records only by anticipation and only with approximate accuracy. The attempt to use stores records for expense data is expedient in some instances, but as a policy it is no more satisfactory than the attempt to compile cost accounts from the check book. Normally, stores and expense accounting are and should be independent; their amalgamation should be exceptional and for sufficient reason.

Conformity to this principle would produce a logical division of accounting work, would simplify accounts, and would be productive of more accurate results. The same principle applies with equal or greater force to direct deliveries. If consumption or use accounting were divorced from acquisition and distribution accounting, it would rid one class of records and their keepers of a burden which they are not, and cannot be, qualified to bear with entire success or satisfaction.

In this discussion it will be noted that departmental stores only are considered. Local stores in shops or other operating divisions correspond to the material room of the factory and are usually so directly related to operations that the requisition or material ticket becomes chiefly a cost document, while at the same time it operates successfully as a stores document. This does not mean, however, that even in such instances stores systems should be used to compile costs or partial costs of jobs or functions.

This adventitious element of cost in stores accounting is frequently aggravated by a practice of taking advantage of an expense distribution record in the store system to distribute the cost of articles which do not go thru stores at all. Similar to this, tho possibly not so bad in principle, is the practice of using the stores system for perishable articles which are issued immediately on a quota basis. In the case of hospitals and other charitable and correctional institutions, this policy sometimes adds greatly to the cost of stores accounting when the purpose of control and statistics could better be obtained by other means.

The Commodity Catalog

Finally, stores accounting is costly for certain legitimate and unavoidable reasons, chief among which are (1) the necessity for maintaining detail accounts for each kind and specification of property, and (2) the necessary labor involved in pricing receipts, issues and inventories. To facilitate the keeping of accounts and the pricing of articles is the task of the accountant, and two of the greatest aids toward the accomplishment of this task are (1) the property or commodity catalog and (2) standard prices for all intra-departmental transactions and records.

Obviously, the cataloguing of property is not a mere detail in stores accounting. Its scope is the entire range of property acquisition and distribution, and its compilation is the work of the property administrator as well as the accountant.

In many situations correct stores accounts cannot be kept without the catalog, particularly where there are in use many tools, repair parts, or other articles without universally recognized common names or with a variety of specifications necessary to their identification. Nothing more absurd is possible than the ordinary inventory of property in a city department taken without the use of a catalog, and nothing more uninforming than some of the requisitions of persons who would probably know what they want if they could see it, but are hopelessly unable to describe or define it. This difficulty of ambiguity and multiplicity of titles and of incompleteness of information is especially effective in invalidating accounts in those departments where the detail stores accounts are kept in a central accounting office separate from and independent of the stock cards in the store or stores.

A Commodity Classification

The first requisite for the property catalog is a classification. The classification of commodities should be logical and self-indexing. It should provide for the future as well as the present. It should be integrated and flexible. Its titles should be mutually exclusive, and they should be capable of definition and of progressive subclassification.

The lack of and desire for such a classification is in evidence everywhere in both public and private business. Most of the classifications in use do not meet any of the requirements named above, and they are usable only by the arbitrary assignment of items to the classes determined upon.

More than this, most classifications in use are entirely local in their adaptation and have no relation to classifications in use elsewhere. In municipal government—usually in connection with budget work—many cities have adopted a single classification for all departments, based upon the familiar accounting distinctions between supplies, materials, equipment and real estate. Sometimes other items, such as "fixed charges" and "contingencies" are added, besides the necessary titles for personal and contract services.

Practically, these classifications are working because they are made to work. They are based not upon the character of the subject matter of the classification—i. e., upon the essential character of the articles bought, sold, stored or produced—but upon the nature of the use to which these articles are put in the hands of the ultimate consumer.

Accountants properly use such a classification for scheduling property whose use has been determined and for analyzing costs of service or products. They do this for the purpose of relating expenditures to the income account and the balance sheet and for the purpose of providing the information needed to finance expenditures. The adoption of such a classification for articles purchased or stored is an attempt to kill two birds with one stone and not only to get a means for classifying and identifying articles purchased but also to obtain by anticipation an analysis of costs according to character of outlay and possibly a control of the application or use of commodities purchased. For those who are familiar with the technique of classification and for those who have attempted to use such classifications as above described, no argument or illustration is necessary in support of the demand for a scientific classification of commodities or the so-called "objects of expenditure."

The President's Commission on Economy and Efficiency began, and the New York Bureau of Municipal Research has continued, work on what is designed to be a universal integrated classification of commodities. The outline published at an early stage of the work of the President's Commission had the fundamental fault just discussed. This first classification has been adopted with modifications in many places. It was undoubtedly an advance over previous classifications, but this was chiefly due to the elaboration of titles and to the perfecting of their definition by subclassification and itemization.

This basis of classification was abandoned in later work. What has since been accomplished and the history of its accomplishment would fill a book, but there still remains so much to be done in the way of subclassification of neglected divisions, of verification of present subclasses by further subclassification, and of balancing, defining, perfecting of titles, and general "truing up" that results are not yet ready for general publication.

This classification is now, however, so far worked out that it is in process of installation in the police department of New York City. Its known imperfections are not sufficient to keep it from giving more satisfaction than any other classification available, and the experience in practical use will doubtless be of advantage in further work. Funds for continuance of this work are not now available, but it is hoped that they will be when the needs and possibilities are made known.

Any scheme for classification must be supplemented with arbitrary lists of items. Code symbols are thus made to consist of two parts: first, a classification number or symbol, and, second, a specification of item number. In a great many cases it would be possible, and in some cases desirable, to continue the integrated classification clear on down to the ultimate item, but this ideal method has the disadvantage of requiring too many digits in code symbols, especially

when the same classification is used in a variety of departments or institutions. The classification above referred to is carried to four places on a duodecimal basis. For repair parts and sometimes for other classes of articles it is frequently possible to adapt manufacturers' catalogs as the item schedules. So far as standard specifications have been adopted, they should be incorporated in the catalog. The system of coding should be one which is adapted to use on punch cards.

The catalog should, of course, not be limited to articles in stores, but should include all articles approved for use in the department and that may regularly be obtained on requisition. The perfecting of this catalog—its subject matter, coding, and form and arrangement of text—will be to some extent a continuous process, but the necessary occasional additions and changes need not interfere with its use or benefit.

Uniform Prices for Standardizing Commodities

As to the pricing of stores, the prevailing custom in government use is to price all articles at prime cost—i. e., in strict conformity with the unit prices shown on the purchase invoice and regardless of losses or other costs not included in those prices. The custom seems to have no justification except a common belief that any other method would be illegal or even improper and unfair.

That the use of standard prices would be illegal in some instances cannot be denied, tho such instances are few. That it would be improper is the very reverse of the truth.

The prime cost method or pricing is troublesome and expensive. The use of standard prices is simple and economical. For municipal work standard prices can be determined for a considerable period of time instead of having to be computed at each new contract. They may be expressed in even amounts, eliminating long decimals and difficult fractions. They may be incorporated in the commodity catalog. They may in large part be committed to memory. They may be applied to periodic totals of quantities, thus eliminating the necessity of pricing individual stores invoices.

Standard prices furnish a more equitable basis for use in intra-departmental transactions of distribution and transfer. They are also better than purchase invoice prices for cost accounting in the ordinary work of city departments, since they eliminate inequalities due to lack of foresight and errors of judgment in the supply division as well as those due to the operation of laws, ordinances and appropriation acts with reference to the letting of contracts. At the same time they eliminate the absurdities arising from attempts to relate stores issues to purchases. For use in estimating, differences in prices of supplies and materials must be taken into consideration in any case, and the use of standard prices does not increase the difficulty or lessen the accuracy of estimates. It is conspicuously true that cost accounts in city departments are continually being invalidated by the introduction of elements which are accidental so far as operations themselves are concerned and which are only in a slight degree, and sometimes not at all, due to differences in market conditions.

Exceptional conditions, such as now exist because of the war, of course, need to be duly considered, but the principles herein recommended may safely be used as a guide.

Standard prices when adopted should be used in charging stores for articles delivered to stores, as well as for crediting stores for articles issued. Organization units and expenditure accounts to which deliveries are made direct should be charged at the same standard prices. Differences between actual cost and the amounts charged to receiving units should be carried to an adjustment account. Adjustment accounts are unavoidable, anyway, on account of shrinkages of stock, and the adjustment for difference in price may be made the means of keeping this account pretty well balanced and thus showing a more accurate prime cost than that obtained from using the unit prices of purchase invoices.

The cost of purchasing, storing and delivering articles must, of course, be included at some stage in the compilation of costs of products or services if reliable and comparable results are to be obtained. That such costs are so frequently omitted in government statistics, even when they equal a large percentage of the prime cost of materials used, is responsible for much suspicion and discrediting of municipal accounts. In fact, it is one reason why the expense of operating stores frequently becomes out of

proportion to their usefulness to the department.

Whether secondary costs should be included as part of the cost of materials supplied to the job or whether they should be distributed to jobs on a percentage basis as a portion of the indirect cost, will depend on circumstances and will be to some extent a matter of opinion. In general, it may be said that the nearer the institution and its operations approach the factory type, the more advisable it will be to use in direct charges the gross cost of supplies and materials consumed and of equipment installed and put to use.

In such cases the method of arriving at standard prices would be about as follows:

1. Determine the annual cost of purchasing, storing and delivering and the prime cost of the annual turnover. From these two facts may be determined the average loading.

2. Classify in as great detail as the particular circumstances warrant the articles purchased and used according to the ratio of the total annual cost of handling to the annual turnover of each. This is for the purpose of modifying the average rate of loading in order to make the standard prices to be determined upon as nearly in accordance with true costs as seems expedient. In this connection it will be noted that the more general the distribution of all supplies, materials, etc., to the different expenditure units, the less necessity there will be for the accurate loading of purchase, storage and delivery costs on individual articles.

3. Eliminate long decimals and difficult fractions by using, where the difference is not too great, the next higher even figures. The margin of safety thus created will apply against inevitable losses of some stock between the original purchase and delivery at the point of consumption.

Wood Shingles and Dynamite

THE great conflagration on May 21, 1917, at Atlanta, again gave proof of the danger of permitting the presence of wooden shingles on the roofs of any city. It also demonstrated the value of dynamite in checking great fires which threaten the very existence of a community.

Long before the fire, the Atlanta Chamber of Commerce advocated the adoption of an anti-wood shingle ordinance by the City Council. The activities of the Atlanta Chamber of Commerce, thru V. H. Kriegshaber, who was then president of the organization, brought about its enactment, but not until the fire had burned the realization of its need into the hearts of every citizen.

The new ordinance, which was introduced in the Council by A. J. Orme, was approved and signed by the Mayor, Asa G. Candler, on June 11, 1917, reads as follows:

Section I. All buildings except those specifically mentioned in Section II of this ordinance shall have roof coverings of standard quality, such as:

(*a*) Brick or concrete surface.
(*b*) Clay or Portland cement tile.
(*c*) Tin or slate.
(*d*) Asbestos shingles ⅛-inch thick, or thicker.
(*e*) Pitch or felt, built up type, four or five plies, gravel or slag surface.
(*f*) Asbestos-asphalt, built up type, four or five plies, smooth or grit surface.
(*g*) Other types of coverings having equivalent fire-resisting properties, approved by the Committee of Consulting Engineers of the City of Atlanta.

Section II. All of the following classes of buildings may be covered with coverings set forth above in Section I of this ordinance, or with standard asphalt-rag-felt prepared roofing, or asphalt-rag-felt shingles, or by any other types of coverings having equivalent fire-resisting properties, when approved by the Committee of Consulting Engineers of the City of Atlanta:

(*a*) Dwellings.
(*b*) Frame buildings.
(*c*) Buildings not exceeding two stories, or 30 feet in height and 2,500 square feet in area, and not used for factories, warehouses or mercantile purposes.

Section III. The top and sides of dormer windows shall be covered same as the roof, or with other material having equivalent fire-resisting properties.

Section IV. If a wood shingle roof is damaged by fire more than 20 per cent, the entire roof shall be replaced with material specified in Section I and II of this ordinance.

If a wood shingle roof is to be repaired more than 10 per cent in any one year, the same shall be entirely replaced with materials specified in Section I and II of this ordinance, except as specified in paragraph one of this section.

Section V. The Building Inspector shall have power to condemn and have removed any wood shingle roof that in his opinion is in such a deteriorated condition as to be excessively inflammable.

Section VI. Within twelve (12) years from the date of the approval of this ordinance any and all roofs covered with wood shingles shall be replaced with roof coverings which comply with this ordinance.

Section VII. All ordinances or parts of ordinances in conflict with this ordinance are hereby repealed.

No less interesting than the brave fight of the members of the Fire Prevention Committee of the Chamber of Commerce to secure the enactment of this ordinance long before the conflagration, is the story of the checking of the flames of the fire whipped into fury by a strong breeze blowing in a northerly direction. Dynamite turned the tide against the fire and practically destroyed the houses in the direction in which the fire was traveling, thus depriving it of inflammable material.

RUINS OF A HOUSE RAZED BY DYNAMITE IN CHECKING THE ATLANTA CONFLAGRATION

When the tremendous proportions of the losses entailed are considered, and the possibilities of far greater losses had it not been for the use of that destructive agent, dynamite, in checking further ravages, there is an increasing interest in the use of the explosive for fire fighting.

Before dynamiting was started by the local representatives of the Du Pont Company, about fifty city blocks had been completely destroyed, but after the systematic destruction of buildings in the path of the flames had begun under their direction, the fire did not get out of four blocks, three of which had been destroyed by dynamite.

The method of dynamiting which proved most effective was to take from one to three cases of 50 per cent Red Cross extra dynamite to a house, depending on its size and structure, place them as near the center of the house as possible on the ground floor and against the strongest wall. This razed the house level with the ground in every case, and in such a condition that the fire companies could get streams on it at once to keep it well wet down.

The practice of tying three or four sticks of dynamite together, priming them and throwing them at random into a house is not to be recommended. This method simply shakes the house and blows out the windows, making the structure more susceptible to the destructive effects of the approaching flames.

Methods and Materials for Paving Between Street Railway Tracks

Third Article—The Practice in Cambridge, Mass.

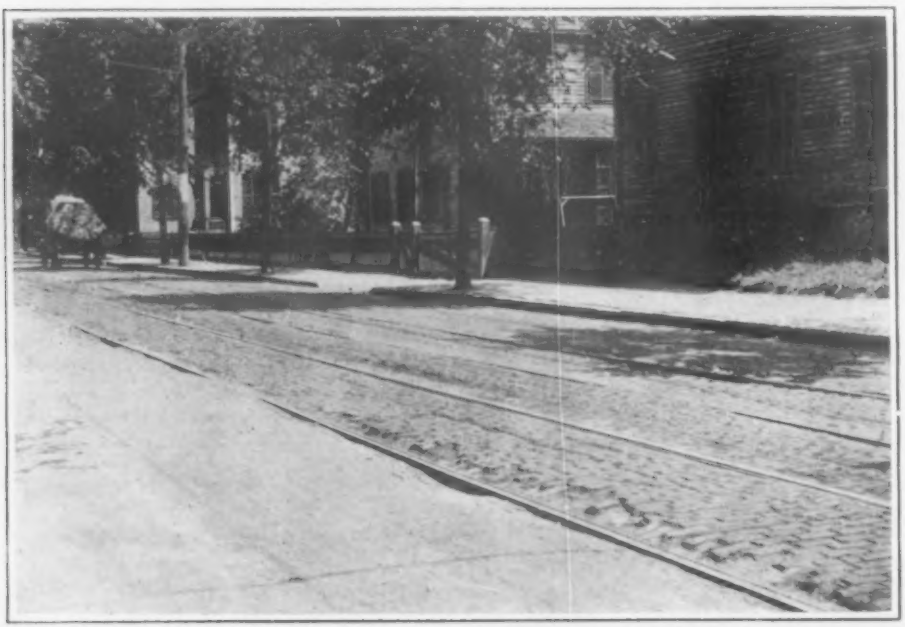
By L. M. Hastings
City Engineer

THE selection of the best and most appropriate methods and materials for paving between the tracks of a street railway is an important, but sometimes a sadly neglected, duty. Upon paved streets it is almost axiomatic that this pavement should conform—at least in a general way—to the pavement on the rest of the street.

In the state of Massachusetts, it is provided in a recent enactment that "whenever a city or town installs a kind of paving or paving base different from that existing in the street, the street railway company shall at the same time, or at such future time as the local authority shall agree to, install the same kind of paving material and base in its part of the street." (Acts of 1916, Chapter 302.) In the city of Cambridge, this practice has generally been followed. Granite, vitrified brick, wood and bitulithic are the pavements most commonly used. Occasionally the street railway company has been allowed to put granite blocks between the rails on streets having other kinds of pavement. While this hybrid paving is not pleasing to the eye or ears, it undoubtedly has the merit of durability.

A question of even more importance than the type of paving itself is that of the foundation and base which carries the track and paving. Probably no single cause is so prolific of uneven surfaces and disintegrating pavements as loose rails resting on weak and inadequate foundations. No matter if the paving on the rest of the street is of the best, if the pavement adjacent to rails has been shaken or displaced by vibration from loose rails, the result is always unsatisfactory and sometimes even dangerous. The accompanying view of such a condition is by no means uncommon.

The remedy for this is twofold: first, a



DISINTEGRATED PAVEMENT, THE RESULT OF LOOSE RAILS

METHOD OF BREAKING BRICK PAVEMENT AND CONCRETE BASE PRIOR TO RELAYING TRACKS

thoro bonding or welding of the rail joints. Where the rails are not welded, the conditions are invariably worse at the joints, as it is impossible to prevent increased vibration at the rail ends; second, placing the track and paving upon some type of practically unyielding base or foundation. That the use of this type of foundation is increasing is shown by an interesting inquiry made recently by Mr. Homer Hamlin, City Engineer of Los Angeles, Cal., relative to the "use of concrete foundation under street railway tracks in important paved streets." Of the fifty-two cities which responded to his inquiries, twenty-nine, or more than 50 per cent, stated that they used such a foundation—some of them in spite of the objections of the railway company because of increased cost and greater rigidity.

The recent article in THE AMERICAN CITY by Mr. G. E. Finck, of Baltimore, Md., is interesting, and his sections represent the best present practice in regard to foundations. Under certain conditions it would seem that a modification of these plans might be advantageous. It sometimes happens that a track is to be laid on such a material as loose sand, gravel, or recent filling, where it is difficult to permanently consolidate the sub-base. In such a case, with the monolithic foundation and pavement, after five or ten years of use, especially with heavy rolling stock and frequent overloading of cars, it will be found that the track has sunk below the level of the street paving and must be raised, a new rail laid, or new ties placed. In such a case the removal of the entire track, paving and foundation is necessary, and this is an expensive proceeding. The Boston Elevated Railway Company has just this condition to meet at the present time on some of the streets in Cambridge, Mass. To reduce the cost, they have taken an ordinary crane car and attached some steel gins in which runs a cast iron hammer weighing about 4,800 pounds, having a round steel point, loosely attached to the striking end of the hammer.

If the track had 6 inches of concrete below the ties on one sheet, then the track laid on the concrete and ballasted with cracked stone and finished with enough concrete to carry the paving, the paving and its base could be removed and the track lifted and surfaced up to the new grade without disturbing the concrete sub-base—a very distinct saving.

Keeping a City's Police Motorcycles in Repair

By Felix J. Koch

THE city of Cincinnati maintains a distinct garage for the repair of the police motorcycles. Substantially all the repairs required for the various "speeder-catchers" are executed in this shop. A considerable saving to the city has resulted from this municipal undertaking, which has also given the traffic squad a confidence in the fitness of their machines to meet all emergencies.

Patrolman Gustave A. Ringhand is in charge of the repair work for the entire traffic police force, and was especially designated for this work because of his natural aptitude for it. He is responsible for about fifteen motorcycles which thirty or more men use and upon which they must be able to depend.

A motorcycle beat is arranged to cover an entire police district, and includes patroling the main thorofares where speeding automobiles are most apt to be found, but not a street-by-street canvass of the area. Controlling the speed evil is the prime duty of the motor-policeman. Within the city limits automobilists may not drive faster than eight miles an hour. In the outskirts they are permitted to go as fast as fifteen miles an hour. However, given a long, clear stretch of avenue without a traffic policeman in sight, especially after a good evening meal, the average motorist is sure to "let her out" a bit.

UP FOR REPAIRS

Since automobilists persist in exceeding the lawful speed limit, the traffic policeman is obliged to make many such pursuits during the day. The fact that these are frequently made at very high speed, also that the machine is usually on duty twenty-four hours of each day, three men riding it in relays of eight hours each, and sometimes over rough roads, makes it necessary for the machine to be sent in again and again for repairs. The motorcyclist occasionally meets with an accident on the road. He immediately telephones to the repair shop for aid. Officer Ringhand, or an assistant, at once leaves for the site of the accident on a motorcycle or in a small auto, depending upon how many tools must be taken along. In the course of a week the repair man will often travel six hundred miles about the city restoring broken-down motorcycles for the traffic policemen. The men take care of their own tire punctures, but all other repairs are made at the garage, which assures rapid, thoro work.

THE OLD WAY OF CATCHING SPEEDERS

FORWARD STEPS

Reported to THE AMERICAN CITY By MUNICIPAL OFFICIALS & DEPARTMENT HEADS

For this department, the editors will welcome short articles from city, town and county officials and heads of departments, on subjects of interest and practical value to others engaged in similar work. Photographs, plans or other illustrative material should accompany the articles whenever available.

... from ... MAYORS

A Municipal Opera House

RIPON, WIS.—Five years ago it was thought that the armory of the Ripon company of the National Guard was inadequate for the needs of the organization. We took steps to provide a larger building, realizing the necessity for the best of housing for our local military unit.

While tentative plans were being drawn for the new armory, it was suggested that inasmuch as there was no hall or theater of sufficient size to properly stage large public meetings or entertainments in Ripon, a large municipal theater or opera house might well be constructed. The suggestion was received favorably, and plans for this structure were added to those for the armory. As coöperation and amalgamation of activities and buildings seemed to be the watchword in the city, it was advocated that the jail should be relocated in the new building. The old jail was objectionably located at that time, according to modern standards for the punishment of wrong-doers, and so it was quickly decided to combine armory, opera house and jail in one large building, thus saving greatly in the cost of construction for three separate structures, and more quickly securing the much-needed buildings.

The cost of the entire structure, including the jail connected with the main building, was $42,714.95; and of this sum $30,000 was paid for by a bond issue which found ready sale, the remainder being paid out of

THE MUNICIPAL OPERA HOUSE AND ARMORY, RIPON, WIS.

the current revenue. The building is of brick and concrete thruout, which greatly reduces the annual insurance premium. The large drill hall for the company measures 60 by 90 feet and the floor is of hard wood laid on a concrete base. There is a balcony around the hall capable of seating 300 people. The auditorium of the opera house is 60 by 90 feet and seats 700 people. The stage is ample for the production of almost any play and has a proscenium arch 20 feet in height. The stage itself is 42 feet wide and 23 feet deep. The jail attached to the building has five cells for prisoners, besides the quarters for the reserves on duty.

The building was dedicated on March 16, 1917, with simple ceremonies and a good, hearty, plain dinner for the members of the National Guard. Since its dedication the armory has been used for headquarters for Company D, Wisconsin National Guards, and the opera house has seen the production of numerous plays and other attractive entertainments.

L. W. THAYER,
Mayor.

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An Unpaid Board of Consulting Engineers a Great Help to Atlanta

Atlanta, Ga.—Early in the present year James R. Nutting, member of the General Council of Atlanta, introduced an ordinance empowering the Mayor to appoint a Board of Consulting Engineers to give expert advice and information to the Mayor and General Council on any matters referred to them and empowering the board also, at its discretion, to make recommendations on any subject connected with the administrative work of the city government. The ordinance was passed and approved, becoming a law January 19, 1917.

The remaining measures included in the ordinance relate to the organization and terms of office of the Board. The Board consists of five regular members appointed as above, but no man is eligible for membership unless he is a civil, mechanical or electrical engineer of recognized standing and with five years' active experience in his profession. In appointing the first Board, only men connected with the Affiliated Technical Societies of Atlanta were named. The term of service is two years. By a provision in the ordinance, the Chief of Construction and the Building Inspector of the city are members of the Board ex-officio.

Thru this Board of Consulting Engineers the city receives expert advice on all technical matters without cost to the city, and as far as we know this is the first municipal board of its kind. Engineers are usually among the most public-spirited citizens, and are often willing to give a large amount of time to public work, with the sole compensation of a consciousness of duty well performed. There is another side to this question, namely, that many engineers are willing to give their time to these public activities for the sake of the legitimate advertising they receive from the work.

The water-works of the city of Atlanta are municipally owned, and a thoro investigation of the needs of the system for the future development of the city is one of the most important matters yet referred to the Board. A modern crematory for the destruction of garbage is owned by the city, and the Board has been asked to investigate the plant and report on measures for improving and increasing the efficiency of its operation.

We have the first municipal installation of Imhoff tanks for the treatment of sewage built in the United States; and as there will be need of some changes and additions to the plant, this matter will be given to the Board of Consulting Engineers for consideration.

In addition to these larger matters, the Board is called upon to give advice as to paving and the many greatly diversified questions constantly arising in municipal engineering activities. It is interesting to note that the decision of the technical board appointed by the Mayor is final in matters concerning the recently approved anti-wood shingle ordinance. This ordinance was under consideration before the great conflagration, but was not passed until after that terrible event.

This Board does not in any way interfere with the employment of outside consulting engineers, should such be considered advisable, but its institution was thought best for the investigation of the problems which the local engineer knows and can best consider from his familiarity with the city.

ASA G. CANDLER,
Mayor.

A DANGEROUS TURN PROTECTED BY SAFETY CURBS TO PREVENT TRAFFIC FROM CROSSING TO THE WRONG SIDE OF THE ROAD

..... from ..... CITY MANAGERS

The Use of Safety Curbs at Dangerous Street Intersections

HUNTINGTON BEACH, CAL.—As in all Southern California cities, the greater part of traffic to and from Huntington Beach thruout the entire year is handled by automobiles and auto trucks. Particularly is this the case in beach cities somewhat isolated from the main routes of steam and electric roads. Especially on Sundays and holidays the auto roads to the beaches are taxed to their full capacity by tourists and pleasure-seeking parties from the interior districts. The very nature of this traffic develops more or less hurried and reckless or careless driving, which leads to an ever-increasing and appalling number of accidents, and the rapidly changing conditions have forced the municipal engineers to undertake a serious study of the subject and to adopt apparently radical changes in order to protect traffic against itself.

In view of these conditions, I considered it advisable for this city to change the location of the main entrance into town and to construct a subway to carry the road under the steam and electric road. It was not possible to obtain a straight approach to this subway from either direction, and the nature of the surrounding country is such that a stranger would not realize that he was approaching a danger point. On entering the subway the grade is steep enough to make it difficult to check speed promptly, altho there can be no danger if the vehicle is in its proper roadway. As a measure of warning, a flat, low curb was built along the center of the roadway to a point readily visible from either approach. This curb is rather flat and wide in order to be of no danger in itself, yet sufficiently high to discourage any tendency to ignore it. It prevents the driver on the outer edge of the curb from cutting over to the wrong side

THE STRAIGHT APPROACH TO THE SUBWAY, HUNTINGTON BEACH, CAL.
Note safety curb in center of roadway

of the street, and is a guide to all drivers in approaching the narrowed roadway thru the subway.

From the east a single highway leads to the subway, but from the west five streets converge to this point in somewhat of a fan shape; and as this location is well out of town, speed regulations are not likely to be rigidly enforced. These intersections, together with the grade into the somewhat hidden subway, create a dangerous condition and make it imperative that all traffic be in its proper place. To insure this I endeavored to make disobedience of traffic rules unpleasant and difficult by the arrangement of light posts and by small parking spaces in the center of intersections, by making the traffic slow down and pass around the obstructions it was also forced to the proper side of the roadway. The curbs, parks and light posts are far more ornamental than signs and cannot be ignored without a very unpleasant sensation on the part of the driver. They also render it almost impossible for a reckless driver to place himself in a position dangerous to others, and represent, to date at least, a successful attempt to protect the foolhardy against their attempts at self-destruction.

GEORGE W. SPENCER,
City Engineer and Manager.

from HEALTH DEPARTMENTS

Home Helpers' Leagues

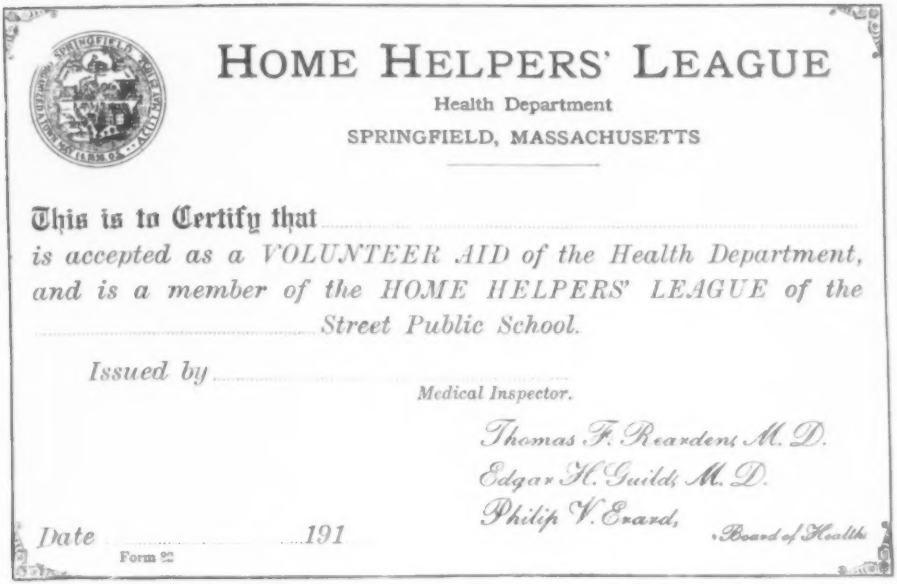
SPRINGFIELD, MASS.—Much work is carried on in cities thru the activity of the health departments in organizing leagues of various names, the primary object of which is instruction in and promotion of health thru its members. Practically all of these organizations use the school as their basis, and continue thruout the school year, with a lessening or cessation of their work during the summer months. We have gone at the health problem of the young from the opposite standpoint and have made the vacation time the period of intensive instruction, while the work goes on thruout the year with somewhat lessened intensity.

The name "Home Helpers' League" was chosen because it seemed to be more general in nature than the name "Little Mothers' Clubs," which is used so generally, altho our league covers practically the same ground as the latter organizations, and also branches out into other fields.

MEMBERSHIP BADGE, HOME HELPERS' LEAGUES, SPRINGFIELD, MASS.

The membership of our leagues is limited to girls of eleven years and upwards. From fifteen to twenty girls are selected from the different grades in each school building. With this number acting as a nucleus, the membership increases rapidly, as few drop out and many seek admission. The members are obtained from the primary grades and are selected by the school nurses, who endeavor to pick out those who would not be likely to receive similar instruction in their own homes. After the pledge cards are signed, the leagues are organized, and later the certificates and buttons are given to the members. The buttons are of celluloid with an attractive metal rim. The meetings of the various leagues are held separately during the months of June, July and August.

At each meeting a nurse gives a fifteen- to thirty-minute talk and the members are questioned on the topics of the previous meetings. The instruction includes the care of the baby, personal hygiene, care of the hair and teeth and general sanitation as regards the cleanliness of the city. Telephone calls are often received from members reporting conditions which need attention. No matter how trivial, the cases are treated with respect, and special care is taken to investigate them promptly. In this manner we rapidly gain the confidence of the mem-



HOME HELPERS' LEAGUE

Health Department

SPRINGFIELD, MASSACHUSETTS

This is to Certify that .....

is accepted as a VOLUNTEER AID of the Health Department, and is a member of the HOME HELPERS' LEAGUE of the .....Street Public School.

Issued by .....
Medical Inspector.

Thomas F. Reardent M. D.
Edgar H. Guild, M. D.
Philip V. Evard,
Board of Health

Date 191

Form 92

MEMBERSHIP CERTIFICATE ISSUED BY THE HEALTH DEPARTMENT

bers; we seek to keep this confidence, for the members ferret out many cases which the department would have little chance of finding until the sickness or nuisance was far more dangerous. The girls surely stir up things in their neighborhoods, and reporting sick babies, dirty back yards, flies, garbage cans in improper order, and refuse are their special delight.

Many members have left school when they were sixteen years old and have set up homes of their own. The good work of the leagues is seen many times in these new homes and as well in the homes of the parents of the younger members.

The leagues were first organized in 1914, have continued full of vitality and interest, and grown in three years from 60 to nearly 300 members. This summer the number will probably go past this mark before the intensive work has ended.

The following table gives a very good idea of the activities of the leagues and their members:

	1914	1915	1916
Talks and demonstrations at meetings, June, July, August	36	65	72
Visits made to babies and others by nurses	216	553	570
Referred to Baby Feeding Association	3	14	10
Visits made on cases reported by members	0	121	50
Cases of sick babies, etc., reported by members	0	65	46
Contagious diseases reported	0	48	8
Poor sanitary conditions reported	0	0	82

The great increase in the numbers of reports of various kinds, visits, and talks and demonstrations at meetings of the leagues from the first year of its organization to the present summer show more fully than words the value of the leagues to the Health Department. The girls have become true "Volunteer Aids" of the Health Department and no small value in its work.

EDGAR H. GUILD, M. D.,
Health Physician.

Municipally Collected Garbage Fed to Hogs

GALESBURG, ILL.—In the latter part of 1916 this city decided to collect and dispose of its garbage as a municipal activity and not leave it to individual efforts, as had been the case for many years. The population of Galesburg is about 25,000 and is chiefly residential in character.

A special tax levy was made to enable the city to purchase necessary wagons for the collection of garbage. Studebaker wagons were purchased for the house-to-house collections. Householders provide their own style of garbage receptacles for the individual storage of refuse between collections. During the past winter about 700 houses out of the 5,000 in the city availed themselves of the opportunity offered by

the city for the removal of kitchen refuse from the houses. This number began to increase as the people realized its benefits, and as the warmer weather approached the number increased to fully double the winter figure. In the present scheme of collection about 900 houses are visited on each of the bi-weekly collections. The collection is under the control of the Board of Health, which has entire charge of the disposal as well.

The city wagons used in collecting carry the garbage to farmers outside the city, where it is fed to hogs. The average haul for the collecting wagons is about two miles, including the trip to the farm where the garbage is unloaded. It is figured that early this spring between 300 and 400 hogs were being fed on the city's garbage. In this number there has been a remarkable absence of hog cholera. There is no contract with the farmers relative to furnishing them with the city garbage, but the system has worked out satisfactorily to both farmers and the health authorities. No money is paid by the farmers for the garbage, for it is considered that the convenience of being rid of the garbage in this way is well worth the cost of hauling it the required distance; on the other hand, the farmers welcome the garbage as an added asset in their hog raising, and therefore the city is not called upon to pay them.

The Health Department feels that something should be done to secure an incinerator which will dispose of the garbage in a more sanitary manner. This would do away with the need of constantly keeping an area available for possible burial of the garbage in case of the loss of a large number of the hogs thru epidemic. The burial area has not been used as yet, because there have been no difficulties experienced with the present method and no hog cholera has developed. If it does become necessary to use the burial method, the department plans to place the garbage in trenches from three to four inches deep.

Ashes are not removed by the city, but most of the houses make use of them for fill in the back yards. This is a perfectly safe and sanitary method of disposing of such dry and stable a material as ashes. It eliminates many unsightly holes and pools.

F. G. HALL,
Commissioner of Health.

..... from CITY ENGINEERS

A Municipal Testing Laboratory

HARTFORD, CONN.—Shortly after the Mayor of Hartford, in his annual message a number of years ago, emphasized the need of a municipal laboratory for the purpose of testing such materials as entered into the construction of sheet asphalt pavements, sewers, and other municipal works, the Court of Common Council authorized the City Engineer to construct and equip a chemical and testing laboratory. This was completed in the fall of 1908, and was located in a small, dark room in the basement of the old City Hall. It was equipped for the testing of cement, sand, stone, paints, oils, asphalts, coal; and, in fact, for most materials used by the various municipal departments.

From year to year considerable equipment has been added. As the scope and importance of the work grew, the old laboratory became generally more and more unsatisfactory because of its cramped and unsanitary location, and in the year 1915 it was moved from the old City Hall to the fourth floor of the new Municipal Building, where a large, light, airy room has been fitted up for use.

Since being installed in new quarters, a considerable outlay has been made in the purchase of new equipment and supplies, and the laboratory now has in use these special testing devices, viz.: a Freas constant temperature electric oven, a U. S. Bureau of standards model dynamometer for the testing of the tensile strength of the rubber lining of fire hose, an Emerson calorimeter, an electric muffle furnace, a Dulin rotarex for the testing of bituminous pavements, a sulphur photometer, a Smith ductility machine, water distilling apparatus, and machinery for the crushing and grinding of coal supplies.

The scope and importance of the municipal chemical and testing laboratory may be best shown by a brief resumé of the work done during the past year:

The testing of asphalts, fluxes and oils when bids for these materials were received; the testing and constant inspection of all paving mixtures; testing of asphalt

THE MUNICIPAL LABORATORY, HARTFORD, CONN.

and concrete sands; fillers for asphalt work, lead arsenate for spraying trees, cements for concrete construction, bricks, paints, cylinder oils, soaps, greases, sewer pipe joint fillers, rubber fire hose, insulated wire, gasoline, coal, etc.

Unquestionably the laboratory repays many times its cost of maintenance thru the high standard in quality of the supplies it assures. This is especially true in the case of the inspection of asphalt paving, where outside service would undoubtedly cost considerably more than the salary of the chemist and the maintenance of the laboratory.

ROSCOE N. CLARK,
City Engineer.

from HIGHWAY DEPARTMENTS

More Work for Less Money

CINCINNATI, OHIO.—The Department of Public Service of Cincinnati serves a population of over 410,000 people living in an area of 70.98 square miles, or on streets aggregating 618 lineal miles. The burden of keeping the streets free from refuse of all kinds rests on the shoulders of this department as essentially a municipal enterprise. It should not be so. It should be a matter of personal care on the part of every citizen to see that he does not permit the addition of any unnecessary refuse, such as newspapers, fruit peelings and peanut shells, to the amount which must be cared for anyway.

This phase of municipal cleanliness has been carefully considered by the many civic organizations of Cincinnati, and particularly in the last few years by the General Committee of the Chamber of Commerce in its Clean-Up and Paint-Up Campaigns. These campaigns have awakened the public to the dangers to health in unclean streets and sewers, and definite actions have resulted.

The scope of the activities of this department is larger than ever, but in spite of this and the ever-increasing prices of commodities and wages, our actual expenditures were lower in the last year than in any of the preceding nine years. This is due to a scientific readjustment in all branches of the work, a change in methods of supervision, an up-to-date accounting and cost system, and a gradually rising standard of efficiency. Cincinnati takes care of all her street and sewer cleaning work at a smaller per capita cost probably than does any city of her size and mileage. The actual expenditures for the last four years in this department were: 1913, $410,868.77; 1914,

COMPARATIVE COSTS OF STREET CLEANING, CINCINNATI, OHIO

	1913		1914		1915		1916	
	Unit Cost	Unit Cost with Overhead	Unit Cost	Unit Cost with Overhead	Unit Cost	Unit Cost with Overhead	Unit Cost	Unit Cost with Overhead
Broom gang, squares	.467	.526	.364	.432	.268	.324	.243‡	.295‡
Street sweepings, cubic yards	.278	.496	.237	.418	.242†	.434†	.270	.476
Ash collection, cubic yards	.293	.478	.258	.446	.277†	.465†	.282	.468
White-Wings, 1,000 square yards	.263	.301	.282	.322	.272	.312	.305‡	.352‡
Broom gang, squares	.467	.526	.364	.432	.268	.324	.243‡	.295‡
Gutters, squares	.295	.326	.150	.166	.132	.147	.136‡	.153‡
Gutters after flushing, squares	.290	.324	.187	.206	.148	.164	.136‡	.151‡

* Increase in wages of 22 2-10 per cent. † Increase in wages of 17 6-10 per cent. ‡ Increase in wages of 12½ per cent.

$378,757.66; 1915, $365,335.93; 1916, $331,-119.40.

With wage increases in our department as high as 22.2 per cent in one year, we have been able to cut down the unit costs of street cleaning and ash collection almost every year thru the efforts and coöperation of practically every man in the department, from bottom to top. Above is shown a table giving in detail the comparative unit costs, with and without overhead charges, of different parts of the activities of the department for the last four years. These figures show to the best advantage the results of our efforts to do our work with less money each year, with more work to be handled, and still maintain our high standards.

Another activity of this department is the elimination of stray dogs from the city. A motorized equipment has aided in increasing the effective speed of the work, and all dogs caught are treated humanely.

FRED MAAG,
Superintendent, Department of Street, Sewer and Catch Basin Cleaning.

from FIRE DEPARTMENTS

Autos "Keep Away" from Fire Hydrants

SAN BERNARDINO, CAL.—We have recently made use of a very simple but effective device in San Bernardino to keep automobiles away from the fire hydrants. Since motor cars have become so common they have more and more usurped the right of way in the thorofares, the parking places along the curbs and even the areas near fire hydrants.

Everyone, except a few automobilists, realizes that the fire hydrant is essential to the fire engine in furnishing it with an adequate supply of water for fire-fighting. Many automobilists drive up to the curb and leave their machines in front of fire hydrants for an hour or more while they transact business in the nearby stores. In case

SAN BERNARDINO, CAL., USES THIS METHOD OF KEEPING ITS FIRE HYDRANTS UNOBSTRUCTED BY TRAFFIC

of fire there may be great difficulty in locating the driver of an automobile, thereby giving the fire a few more minutes' headway before a stream can be put on it.

This condition is bad when one or two machines are parked near the hydrant, but it is infinitely worse when the entire block is lined with machines. When they are all parked parallel with the curb, they are practically interlocked and no individual machine may be removed without rolling the entire length of all the machines in the block far enough to let the one machine in front of the hydrant turn out. The drivers of the majority of the machines which have to be moved are perfectly innocent of any wrong, but, by the method of parking, the machines are so arranged that all drivers become participants in the crime thru the carelessness of the one who leaves his machine in front of the hydrant.

One method which has been used successfully in many cities has been to require every machine to be run in at an angle of about 45 degrees with the curb, thus enabling any machine to back out without moving all in the block. This, however, does not prevent or check the parking of machines in front of the hydrants.

Our method of keeping all vehicles away from the curb hydrants is backed by a city ordinance which states the method of warning and the penalty for not heeding it. The curbs in front of the hydrants are painted a bright red for several feet either side of the hydrant, and the words "KEEP AWAY" are painted in white on the red curb directly in front of the hydrant. This has been very effective, as anyone, whether he knows the city ordinances or not, may read the warning and stay away from the prohibited area.

The effectiveness of this method is not the only argument in favor of it, for it costs very little to mark the forbidden territories.

F. G. STARKE.
Former Fire Chief.

from PUBLIC WORKS DEPARTMENTS

Chicago's Great Municipal Pier

CHICAGO, ILL.—The completion of the immense municipal pier at Chicago is an expression of conscious effort on the part of the city to provide adequate facilities for the great lake commerce which it enjoys, and to win back some of the trade which it has eliminated by lack of accommodations. This is, however, stating its purpose from the business standpoint, thus telling only half the story, for, in addition to its usefulness as an asset to commerce, it has been planned with an eye to great service in the recreational and civic phases of municipal life.

In describing this structure one inevitably begins with the word "immense." It is this feature which impresses even those

THE RECENTLY COMPLETED MUNICIPAL PIER, CHICAGO, ILL.

whose acquaintance with such structures is more than casual. The total length of the pier is 3,000 feet, almost three-fifths of a mile. It is 292 feet wide, and it allows a dockage of 8,500 feet. What contributes most to the impression of vastness is, however, the length of the buildings on it. At its west or shore end is the Head House, containing the administration offices and the ramps leading to the floors of the freight and passenger buildings. These freight and passenger buildings extend east from the Head House for a distance of fully 2,340 feet. Each of the two buildings is 100 feet wide with a 6-foot dock on the outside, and between them is a roadway 80 feet wide. The main floors, on the dock level, with an area of 456,300 square feet, are to be used for freight and package handling, the second floods, with an area of 308,880 square feet, being set aside for use by passengers only. The passengers will embark and disembark at these floors to the upper decks of the steamboats, or in special cases may use inclined stairways to the lower decks.

On the east 665 feet of the pier are two artistically designed buildings serving recreational purposes. The terminal building has a large dance hall, a refectory and children's amusement rooms. There are large lavatories and rest rooms. The great concert hall extends practically the entire width of the pier, and radiating from the circular front of the building are concrete terraces which lead down to a broad, open plaza reaching to the end of the pier. The landing place at this end is used exclusively by passenger steamers, including the smaller pleasure excursion steamers running to Lincoln Park, Jackson Park and other points along the shore of the lake. Passengers will be able to reach all steamers by street cars coming from the street over inclined tracks to the passenger floor and running the entire length of the pier to the recreation section at the east end. Connecting roadways will permit access to all sections of the passenger pier by all forms of vehicles.

Besides the outer pier proper, some collateral improvements that have been authorized by the City Council will have a marked beneficial effect on surrounding property. In addition, the lake is to be filled in over an area extending east from the lake shore 1,100 feet and 400 feet in a northerly direction. This filled portion will be used as a boulevard with direct access to the pier approach. The dock surrounding this fill will provide dockage for small boats. On the pier approach, to the south, and contiguous to the Head House, the new area of filled ground will be utilized in the construction of a large and well-equipped convention hall.

It is as a recreational facility, however, that this pier presents most attraction to the average citizen of Chicago. Here is an opportunity for rest and enjoyment in summer on the coolest spot in the city. A mile removed lie Chicago's ridges of office buildings. The citizen bent on recreation may enjoy a pleasant walk along the promenades, attend a free concert or partake of the other opportunities offered. Mothers can come there with their children, or "big sisters" can bring along their charges, and amidst cool lake winds in summer, find adequate facilities for their enjoyment.

HUGO KRAUSE,
Superintendent, Municipal Pier.

from WATER DEPARTMENTS

Protection Afforded by Dual Water Supply System

Goldsboro, N. C.—The water-works plant of Goldsboro was built about twenty-five years ago. The equipment, consisting of two 250,000-gallon Warren gravity filters and two Worthington steam pumps, became entirely inadequate for the needs of the city about 1912, so that a new plant was built and put into operation in 1914 and the old plant was scrapped. The filters were still in fair condition, but the pumps had become worn out.

The new plant is located on the bank of the Little River and has a capacity of 1,000,000 gallons per day. There is one reserve filter and one filter that has not been equipped, but which will be made ready for service when the needs of the city require it. The present daily consumption of the city is 500,000 gallons. The pumping equipment for the plant consists of two 1,200-gallon per minute steam reciprocating pumps, one 1,200- and one 750-gallon per minute centrifugal pumps operated by electricity. In addition to these pumps there is the necessary auxiliary equipment for wash water, air and lift.

GENERAL VIEW OF GOLDSBORO, N. C., FILTRATION PLANT
Circular 500,000-gallon clear well in foreground

The plant is located a little over a mile from the center of the city and is connected to the city stand-pipe, which has a capacity of 200,000 gallons, by duplicate 12-inch mains right up to the discharge pipes of the four pumps. The pumps, pipe lines and valves are so arranged that with three pumps and one force main out of commission the city will not lack sufficient water for domestic purposes and to fight an ordinary fire. The plant is operated chiefly by electricity from a nearby hydro-electric station, but there is an auxiliary steam plant always warm and ready to come in and take the load in case of accident to the electric power lines. The city's mains are laid out on the gridiron system and have the hearty endorsement of the Underwriters.

Hypochlorite was used for several years as the sterilizing agent for the filtered water until quite recently, when a chlorinating apparatus was purchased and installed because of the greater ease and certainty of operation.

The income from the plant does not pay interest on the bonds, but does pay all operating and maintenance charges and the depreciation charge, with a net annual cash balance of about $9,000. Water is supplied to the city free of charge, and we maintain 150 fire hydrants without cost.

C. M. GRANTHAM,
Superintendent, Water Department.

Water Company Successfully Encourages Home Gardens

THOMPSONVILLE, CONN.—Three years ago the Thompsonville Water Company could scarcely furnish enough water for the needs of the town, and consequently all unnecessary use of water, such as sprinkling lawns, was put under the ban. After the installation of about 1,800 meters, the daily consumption of water for all purposes was reduced nearly 50 per cent. This great saving has enabled us to keep up with the demands of the town ever since without undue expense and greatly to the satisfaction of the consumers.

When the present conservation agitation for home gardens was started, many of our consumers, remembering the scarcity of water three years ago, wondered whether they could afford to use the extra amount of water needed for sprinkling. Then, too,

CHLORINATING APPARATUS AT GOLDSBORO, N. C., REPLACING HYPOCHLORITE FOR STERILIZATION OF FILTERED WATER

there was the thought that it must be paid for at the same rate as water for the usual domestic purposes. The company promptly came to the rescue of the home gardens by sending out reply postal cards to all consumers and inserting advertisements in the local paper. The card sent out read as follows:

ANNOUNCEMENT

To the Public.—To encourage Home Gardening and to assist in maturing crops, we will supply water for this purpose at the reduced rate of 20 cents per thousand gallons.

This means that we deliver at your faucet *one hundred gallons of water for two cents*, or approximately a barrel full for one cent, under sufficient pressure for satisfactory use.

Terms.—This rate will be given during this summer for the quantity of water used in excess of the quantity of water used for the same period last year, providing the minimum rate charge is exceeded.

This rate will apply only to consumers who have planted a garden, or who have an outside hose cock installed for watering or lawn sprinkling, and have notified the Company in advance that they desire to take advantage of this rate.

THE THOMPSONVILLE WATER COMPANY.

On the reply card was an application for the special rate of 20 cents per 1,000 gallons for all water used for gardening or lawn watering. The application further formed a contract with us whereby we would furnish this water and provided that it should be measured by the excess over and above the amount used last year, provided that the minimum rate charge was exceeded.

The response to this offer was widespread, and now the whole town of Thompsonville is blossoming with many fairly large, well-cultivated gardens. We were able to do this by reason of the economies of three years ago, when we made the town 100 per cent metered and thereby practically checked all waste.

WALTER P. SCHWABE,
President and General Manager, Thompsonville Water Company.

Business Men's Council Puts Municipal Utilities on a Sound Basis

SILOAM SPRINGS, ARK.—In 1910 Siloam Springs elected a Business Men's Council to administer the affairs of the city, which were in a very poor financial condition. The city owned its light and water plant, but had not been able to make it pay for several years.

When the Council took charge of the light and water plant it was practically necessary to rebuild it thruout. The writer endorsed the paper in order to secure the $15,000 needed to carry out the work. Almost as soon as rebuilt, the plant began to make

CITY HALL, FIRE STATION AND HOSPITAL BUILT MAINLY BY FUNDS FROM THE REORGANIZED WATER DEPARTMENT, SILOAM SPRINGS, ARK.

MUNICIPAL POWER PLANT, SILOAM SPRINGS, ARK.

good returns on the investment, and the debt was paid off in thirty months. In rebuilding the light plant two new generators were installed, two new engines and a complete switchboard equipment were added. The wiring of the entire city was renewed. At the water plant a pumping engine was added to the equipment and the electric power line was extended from the electric plant to the spring from which the city obtains its supply, about a mile and a half away.

Three hundred White Way lamps were installed on two lighting circuits, without cost to the city, all the expense being borne by the successful electric light plant. The city is supplied with fifty-seven fire hydrants without cost, and out of the combined earnings of the plants $10,000 was appropriated for a Municipal Building, which has since been erected. A public hospital has been erected over the Municipal Building, from private subscriptions. The city plants furnish water, light and heat free.

At present we are installing two 150-horse-power boilers, which will put the plants in debt somewhat; but we feel sure that with no catastrophes we will be able to pay off this debt within twelve months. There are innumerable improvements in other departments which we have been able to aid with appropriations from our earnings, such as the street department; when their funds are low and repairs are greatly needed we furnish the money.

Our rate for lighting current has a maximum of 12 cents per kilowatt hour, and our minimum power rate is 2½ cents per kilowatt hour. We are now paying $2.75 per ton for mine run coal on board cars at the plant.

While the present committee in charge of the water and light plants have administered this particular utility for seven years, they do not feel that its success is due to any particular adaptability on their part for this work, but solely to the fact that they have endeavored to run the plants carefully and economically exactly as tho it were a personal business enterprise. It is safe to say that the plants are worth about $500 a month to the city in earnings, not including the street lights and water for fire hydrants, which are furnished free.

The committee feels that it would be well for many other cities to try the scheme of letting active business men instead of politicians administer their utilities. Business men know the principles on which the plants should be operated. Politicians may know the principles, but are more liable to let them go as they will without too much attention as long as they cause no trouble.

CONNELLY HARRINGTON,
Chairman, Water and Light Committee, Business Men's Council.

from PARK DEPARTMENTS

Old Quarry for Municipal Swimming Pool

Rockford, Ill.—One of the most interesting additions to the park system of Rockford in 1916 was the old city stone quarry. This tract of land, about 6 acres in extent, had been quarried for many years and a small portion of it excavated to a point below ground water level. The water area covers approximately 1½ acres and offered a fine opportunity for beginning the solution of the swimming pool problem in Rockford.

Previous to the use of "Quarry Pool," as this swimming pool has been named, the department tried to find sites along the creeks in the city for swimming pools, but in practically every case the reports on samples sent to the Illinois Water Survey were "unfit for bathing." This brought about the use of Quarry Pool for bathing, as illustrated on the front cover of the September City Edition of The American City.

The pool, which has a capacity of about 1,750,000 gallons, is fed by seepage from a nearby creek at the rate of about 225 gallons per minute. The upper pool is maintained at a depth of about 3 feet by an overflow channel in the rock, the excess water flowing into a slightly lower quarry, from which it is pumped into the creek about 2,000 feet distant. At the rate of flow given above, the water of the upper pool is renewed in approximately five and a half days.

The pool was used for the first time as a swimming or wading pool during the hot spell at the beginning of July, 1916. No particular arrangements had been made regarding the sanitation of the pool. A very sudden rise of temperature occurred, which lasted for several weeks. This caused a rush of bathers to the pool and the consequent pollution of the water to such an extent that it was necessary to drain the pool and thoroly clean it.

The first intimation of trouble at the pool came from the prevalence of eye and ear infections and cases of "swimming fever." Out of the 1,500 people using the pool daily there were only 120 cases of infections, but immediate steps were taken to protect the health of the community. Some cases of typhoid fever were reported, but thoro investigations showed them to be solely colon infections.

It was in July, after the pool had been in use for only a few weeks, that the health department condemned it and it was closed, pumped out, cleaned of vegetable growth and allowed to refill again. From this time on the water was treated every day under the direction of Dr. John R. Porter, who assisted the Board of Health in its work. Nearly all the infection stopped, due to the use of from one-half to two pounds of copper sulphate per day, depending on the number of bathers. Bacteriological counts were made almost daily from July 27, when the pool was refilled, until August 25. The number of bacteria per cubic centimeter of water was reduced almost steadily from 10,900 to 730 by the application of copper sulphate in small quantities. Thru the work carried on in Dr. Porter's laboratory it was found that it required about four days and 4 pounds of copper sulphate in the water to destroy the harmful types of bacteria. The remaining organisms were of the type of the harmless air and water varieties.

This year, thru the inability of the Park Department to secure full title to the quarry, it was impossible to erect shower baths. In consequence, it was deemed advisable to start in with 10 pounds of copper sulphate before the pool was opened and then use 2 pounds of the same chemical each day that the attendance was large. Thus far the results have been very satisfactory and highly appreciated by all users.

It is by making use of the best that is at hand and by practising the greatest precautions for the protection of the public that their comfort and health are conserved. We believe that the use of the depression in the quarry floor was a step in the right direction in affording the public a place to cool off in hot weather. Further, all possible steps are being taken in sterilizing the water of the pool, that there may be no discomfort from bathing nor any case of disease communicated thru its use.

PAUL B. RIIS,
Superintendent, Rockford Park District.

Increase the Safety of Our Highways

By W. H. Losee, B.Sc.
Assistant Engineer of Highways, Ontario, Canada

THERE are a few localities on this continent where accidents are not actually increasing, but these are, unfortunately, altogether too few. The sale and use of the automobile is becoming greater each year, and the number of accidents caused by it are increasing as well. Were it possible to obtain an accurate account of the number of people injured and killed annually, there is little doubt but that great force would be brought to bear to reduce this awful waste of human life.

The causes of accidents are many and varied, but perhaps the great majority of them may be attributed to the carelessness of the drivers of cars and of pedestrians. "Safety First" campaigns are doing much to educate all classes of citizens to the need for constant care to be free from injury.

Professional chauffeurs are apt to be more careless than owners who drive; they have less to lose in an accident and constant driving has made them so skillful that they take many chances which an owner would hesitate to negotiate. Children heedlessly running into the street after a ball or other plaything are the cause of many injuries in the city. It must be remembered that not all the bad accidents occur in the cities, for the country has far more than its share. The condition of roads and the means taken to protect the traveler against trouble because of narrow approaches to bridges or subways are factors to be considered if we are to make our highways safer for touring.

Many of the main roads of to-day follow the same winding path that was blazed out of the forests by the early settlers. We often traverse a winding road over steep hills and across narrow valleys on which little regard has been paid to the alignment and grade.

The following photographs tell their own stories.

A substantial guard rail on a hillside road protects the motorist from any possibility of running over the edge of the roadway and down a dangerous slope. White paint used lavishly aids the driver in locating the limits of the paved way at night when, even with strong headlights, one may easily drive too far to one side of the road located on the edge of a deep ravine and cause a serious accident. Those who have driven at night when there is a full moon and fleeting clouds well know the deceptions of the headlights on flat-toned objects, hence the white paint on the guard rails and fences is very important.

Bridges on many of our roads are built so that the center line of the bridge is at right angles to the course of the stream. If the road does not cross the stream at right angles such a location will cause a sharp turn on and off the bridge and materially increase the chances of serious accidents. If it is not found economically possible to build the bridge with its center line parallel to the line of the road, then it would be better to change the roadbed so that there would be at least 150 feet of tangent at each end of the bridge.

Sharp turns with a short sight length similar to this should always be avoided. Such subway crossings on country roadways are almost as great a menace to the traveling public as grade crossings. The economical construction shown here is dangerous.

An improved highway always invites use and is soon discovered by motorists, hence new or improved thorofares should be constructed with motor traffic in mind. Ample width, a low crown and an easy slope to the side ditches make a road safe for all.

In flat sections of the country deep ditches are often found necessary to drain the farm lands. These are generally located in the road allowance between the traveled roadway and the fence, whereas they should be placed within the limits of the field they are made to drain. In the latter case, if not properly protected, they might menace the safety of the machinery and stock of the farmer tilling the field when he reached the area near them, for he might drive too close and wreck his own tilling or reaping machinery. With his own interest in mind, the farmer places the drainage ditches on the highway side of his fence, not realizing that by doing so he has menaced the safety of the highway and may be indirectly responsible for scores of accidents to the traveling public. On this page are shown two road ditches which are likely to cause accidents at any time. In the upper picture there is no protection afforded the automobile which may have to turn out for a load of farm produce. The sides of the ditch are steep and the machine may easily turn turtle. The lower illustration depicts a treacherous ditch which has a weak and ineffective guard rail.

Often the roads run down steep embankments with a sharp turn at the bottom, leading onto a narrow bridge. Such a condition, as illustrated above, gives much concern to a driver of a heavy load, as the brake may refuse to act, and he finds himself traveling at such a speed when he reaches the bottom of the slope that he is unable to make the turn, with the possible result of injuries to himself and wagon. By a change in the location of the road, or by raising the bridge, a proper approach may be obtained, and the elimination of one serious accident would more than pay for the extra work. Too much emphasis cannot be placed on the proper location of our highways, as the location is the most permanent part of any road.

By far the greatest number of accidents that occur to-day are at grade crossings. So numerous are these crossings that it is difficult to eliminate them; however, many may be done away with thru the use of a proper subway. A proper subway includes an ample clearance overhead and a long, straight path leading to the crossing itself, enabling the drivers to see all traffic ahead of them, as shown in this picture. Some method of keeping drivers on the right side of the road is necessary if there is any curve in the road near the subway. This may be accomplished if curbs are set in the center of the roadway sufficiently high to be readily seen, but not so high that they will be the cause of accident if ignored by the reckless driver.

Efficiency in City Forestry

By J. Harry Rich
Consulting City Forester

EFFICIENCY, the underlying factor for ultimate success, has been applied to nearly every large undertaking. To what extent has it been applied to city forestry?

The city in which I live has a total of 51,400 street trees. Of these 12½ per cent are mainly poplars, with a few soft maples, every one of which will in time be removed. Figures show that the average cost of removing such trees in this city is a little over $5 per tree; in other words, a needless expense of more than $30,000. This does not include the initial cost of stock, of planting, etc., nor does it include damage to sewers, the heaving of sidewalks, the excessive impoverishment of the soil, the inconvenience of slippery walks caused by the fallen panicles of staminate flowers and the early falling of the leaves.

Nor does the above estimate include the waste due to excessive planting everywhere. As a rule, trees are planted too closely. I do not believe that the average space between trees in this city is more than 20 or 25 feet. A better effect would have been produced had this space been doubled. Think of the money that could have been saved by proper selection and spacing!

A certain village of five or six thousand inhabitants has 16 miles of streets. The street tree mileage is double this on account of the planting on both sides. There are planted on the street line 8,046 trees, of various types and varieties, with not very much regard to symmetry or forethought as to future effects. We find here the same proportion of poplars, soft maples and decrepit old specimens as elsewhere, but the point I wish to emphasize is that the average distance between trees is only 21 feet. In many cases the distance is not greater than 12 or 15 feet.

How can we expect trees to thrive and maintain a healthy condition under these circumstances? How much more beauty and symmetry would be displayed were these spaced just twice the distance. Consider not only the initial saving, but the saving in cost of maintenance with just one-half the trees to care for. The trees would then develop more nearly to the desired height, there would be fewer dead branches to remove, and the trees would be individually more healthy and sturdy.

From here let us go to a little town in the Middle West. There we find whole streets planted with box elder and populars. The excuse is, "We want immediate effects," or "Mr. So-and-So planted them." No one seems to want the responsibility for their existence. These trees certainly have immediate effects, but what have they done for the future? Here is an opportunity for an arboricultural efficiency expert.

But this brings us face to face with a serious problem. How many arboricultural efficiency experts have we? I mean real ones, not self-termed experts with a few months' experience at tree surgery, but technically trained, wide-awake men, familiar with all phases of esthetic forestry. We have a few, but not enough to meet the coming demand.

According to the best information at hand, I find that we have in the United States about 250 city foresters. This by no means signifies that we have 250 technically trained city foresters. In fact, that can be said of very few. And yet many of them are doing wonderful work, while others would accomplish much more were they better fitted to fill their positions.

The other day I read an article written by a city forester, recommending that old bricks, cobbles and old mortar could be used for filling cavities in trees. Had he been more conversant with this phase of his work, he would have recommended that just such materials should not be used, as they do not give enough strength and are apt to be unsatisfactory in other respects.

Some time ago I came upon a city forester to one of our first-class cities who did not know that pure creosote was ever harmful to the growing tissue.

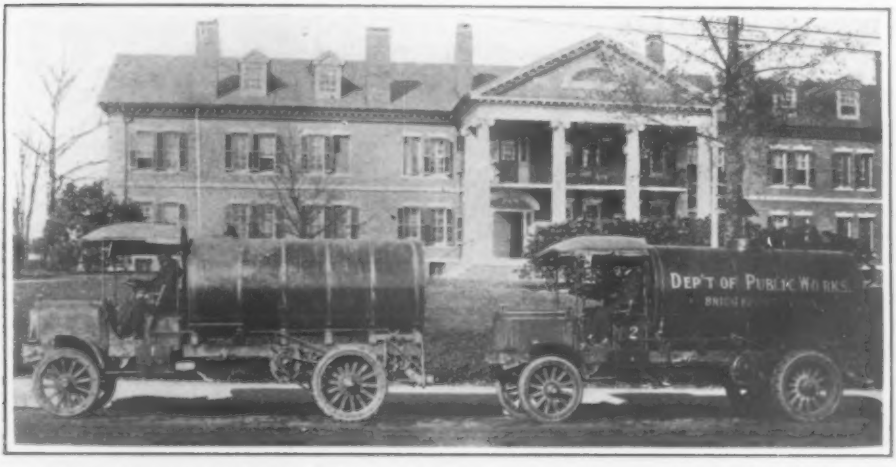
I make these references with the belief that the future demand will not be for men with simply a general knowledge of the subject, but will require of such aspirants a specialized training in entomology, phytopathology and plant histology, as well as a general knowledge of plant materials, and good executive and administrative ability.

Diversified Uses of Motor Apparatus

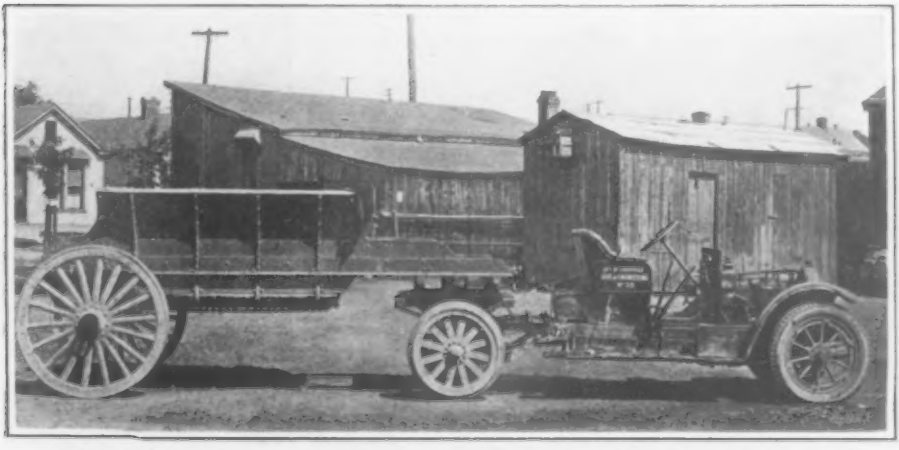
AMERICAN-LA FRANCE COMBINATION CHEMICAL AND HOSE TRUCK WITH JUNIOR PUMP (AT RIGHT) IN SERVICE IN VENICE, CAL.

RESCUE TRUCK USED BY FIRE DEPARTMENT, BOSTON, MASS.

THE WATER DEPARTMENT, WASHINGTON, D. C., USES THIS TROY TRAILER TO INCREASE THE CAPACITY OF THEIR MOTOR TRUCK EQUIPMENT. GOODRICH TIRES ARE USED ON THE TRAILER



PACKARD ROAD OILING TRUCKS USED BY THE CITY OF BRIDGEPORT, CONN.



A CONVERTED TOURING CAR WITH 3-CUBIC-YARD WATSON SEMI-TRAILER USED BY THE DEPARTMENT OF ENGINEERING OF LOUISVILLE, KY.

Why?

When you can make one pole serve as an ornamental lighting standard and trolley wire support.

Why Use Two Sets of Poles?

THE ELRECO method of making one pole serve a *double purpose* means *double service at less than one half the cost.*

Compare the ELRECO method of converting the ordinary and plain trolley pole into a handsome lighting standard, with ornamental base and lighting fixtures. With the old way where there are *two sets of poles*, double expense, obstructed curbs and *necessary underground wiring*. Quite a difference and saving in expensive equipment, isn't there? Underground wiring isn't necessary with ELRECO Combination Poles either.

ELECTRIC RAILWAY EQUIPMENT COMPANY
CINCINNATI, OHIO U. S. A.

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Cincinnati, Ohio
New York Office - - 30 Church Street

Bracket 10347 and G. E. Novalux Unit Form 4

Bracket 10338 and G. E. Novalux Unit Form 9

Brighter Nights in a Better City

By Ren H. Rice
Assistant Secretary, Spokane Chamber of Commerce

THE city of Spokane, Wash., recently completed the installation of a modern system of electrolier curb lighting on another of its business streets. Five of the main downtown thorofares now are illuminated all night. The lighted section is a little over one-half a mile long and five blocks wide. At any point along these streets at night it is possible to read a newspaper with ease.

Large, cone-shaped, luminous arc lamps mounted on iron posts are set in the concrete curbing at intervals of 100 feet. The lights are 6.6 luminous magnetite arcs and have proved a source of pride to Spokane citizens.

When the first new lamps were installed on a portion of Riverside avenue three years ago there was much skepticism as to their business value. Now merchants on the cross streets in the downtown district who have seen the accelerated business on the main thorofares due to the change in lighting methods are circulating petitions to have the systems extended to their own streets.

Spokane does not buy much at night, except on Saturday evenings, when a few stores are open, while two of the largest retail establishments close at 6 P. M. Saturdays, as on other days. The new lights have changed business as well as other conditions. The owners and tenants of buildings in the lighted area now look upon their property as more on exhibition than formerly. In the rush of the daylight hours the feeling prevailed that people were too busy to pay much attention to the external appearance of buildings. When night comes now, there is more leisurely travel. Passersby take time to note conditions. Every detail of a store structure is brought out strongly by the illumination. It seems as if the downtown section was displayed on a brilliantly lighted stage. Just as a man instinctively rearranges his attire for the evening, so the building occupant feels impelled to dress up his place for the night parade.

The result has been the rehabilitation of many edifices with the coöperation of landlord and tenant in tearing down unsightly fronts, the use of more plate glass, greater

FALLS OF THE SPOKANE RIVER WHICH PROVIDE POWER TO LIGHT THE CITY

AZTEC ASPHALT ON FIFTH AVENUE
Over 17,000 vehicles pass over this pavement daily.
Over 6,000,000 yearly.
Over 20,000,000 since it was laid.
Every day's service is equivalent to a month on a heavy traffic street of a large city—the aggregate to date exceeds the longest life of many such pavements.
Not a cent has been spent in repairs and the pavement is in excellent condition—good for many more years of service.
This is a demonstration of Aztec quality—there are hundreds of others throughout the United States and Canada.
THE UNITED STATES ASPHALT REFINING COMPANY
90 West Street, New York
Section of Fifth Avenue, New York, the world's heaviest traffic street paved with Aztec Asphalt.

When writing to Advertisers please mention THE AMERICAN CITY.

RIVERSIDE AVENUE, SPOKANE, AT FOUR IN THE AFTERNOON

taste in signs, more attractive window displays and a better kept "front" at all times.

It pays the tenants to coöperate. Increased lighting has brought increased traffic. Spokane people, always accustomed to promenading the business district to a considerable extent, are now found in still greater numbers at night. They have time during a stroll to note goods on display. More business is the natural result.

The landlord also finds it pays. He gets more rent than formerly.

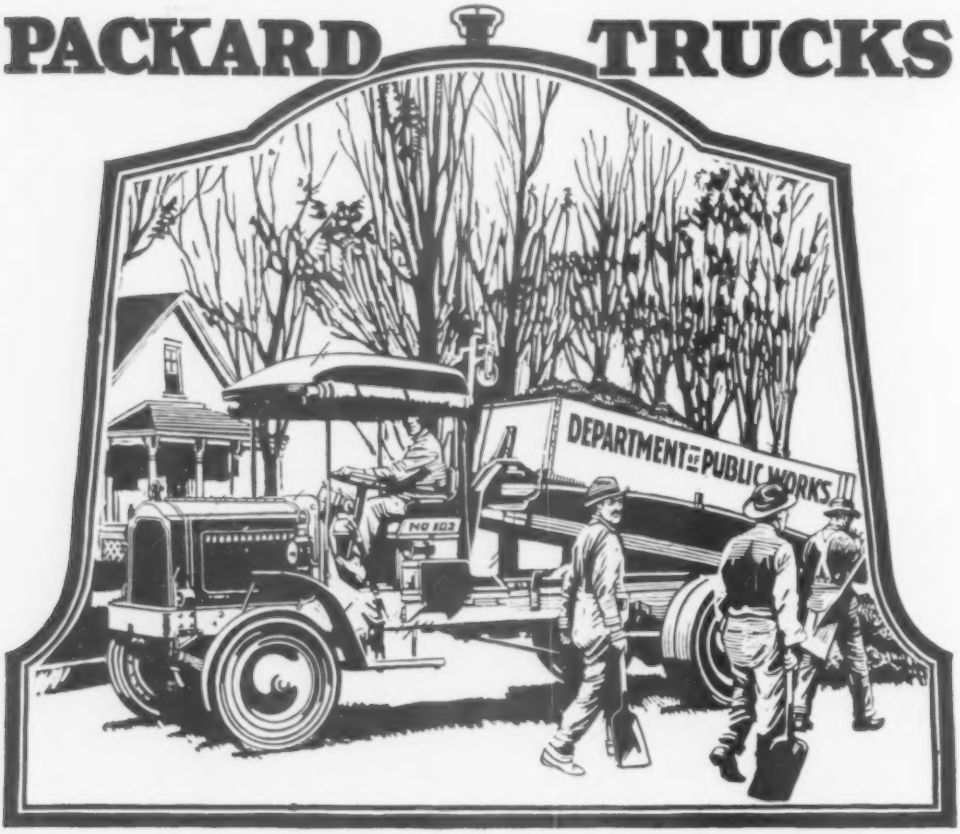
The police department is enthusiastic over the lighting as a means for preserving order and enforcing the law. Corners which formerly were rendezvous for mashers, loafers and other undesirable persons have been cleaned out thru the application of strong light. Their actions became too public for safety. They quit. Women and young girls stroll the streets in the evening free from molestation. The lighting has had a large share in protecting them.

The system costs $75 per year for each electrolier, this charge covering the installation, current and maintenance for ten years. The city pays one-fourth and the property owner three-fourths of this charge. At the end of the ten years' period the city becomes owner of the system. Power for the lighting is generated at the falls of the Spokane River, which flows thru the city.

Thus has the power of the vast stores of "white coal" in the Spokane River been the means of providing greater protection to the citizens, both morally and financially. We have taken advantage of the great offering and have benefited from it.

AT 3 A. M. RIVERSIDE AVENUE IS ALMOST AS BRIGHT AS DAY

PACKARD TRUCKS



"A yard ahead!" In city hauling Packard capacity and economy count.

Owning six Packard trucks of 6 to 6½ tons capacity, the Detroit Department of Public Works has found them so efficient and reliable that it has ordered four more heavy-duty units.

Of the twenty-three Packards in Detroit municipal service, five are hauling asphalt. Two of these have travelled nearly 19,000 miles each, without having even to take up the connecting rod bearings.

Each mighty Packard, in addition to its six-ton burden, pulls a six-ton trailer—delivering maximum loads at minimum cost.

Silent, chainless Packards are built in seven *right* sizes—1 ton to 6½ tons. *Four-speed* transmission on all models multiplies pulling power and saves gasoline, tires and up-keep. Write Packard Motor Car Company, Detroit. *Ask the man who owns one.*

Packard

News and Ideas for Commercial and Civic Organizations

Important September Conventions

TWO gatherings of exceptional importance in the commercial organization field will be held during the month of September. These will be a war convention of the Chamber of Commerce of the United States, to be held in Atlantic City, September 17 to 21, and the annual convention of the National Association of Commercial Organization Secretaries, to be held in Chicago, September 24 to 26.

An emergency call has gone forth from the Chamber of Commerce of the United States to the business men of the country to attend the Atlantic City convention. It is expected to be the largest gathering of business men ever held and one of its objects is to show the world that American business recognizes its duty in this crisis and stands solidly behind the government in the war.

The principal topic of discussion will be the duty that business owes to the government in war time. Then will come the question of how the business of the country may render even greater service in winning the war. This will include what may be done to control prices; how priority may be established most quickly and effectively; how greater efficiency in land and water transportation may be developed; how we may best provide for and protect our forces on land and sea and those dependent upon them at home; and what steps may be taken for the better education of the nation on the issues at stake in the war.

Ways and means by which business may be made to adjust itself to the conditions produced by the war will be considered. Also there will come the questions of how we shall provide for those business enterprises not essential to the nation in war time; food conservation, its special importance to business men; industrial relations and employment problems, and foreign trade, banking and credit in war time.

Of interest also will be the readjustment after the war for which business must prepare. This will include the question as to what will be the course of prices on raw materials and finished products after the war; how we shall plan for replacing our men in industry after they return from the war; and what new responsibilities in international relations may be expected after the war.

The program of the National Association of Commercial Organization Secretaries, as it stood on August 22, when this issue of THE AMERICAN CITY went to press, was as follows:

MEMBERSHIP DEVELOPMENT AND MAINTENANCE
Speaker: J. R. Babcock, Dallas, Tex.
Leader of Discussion:
Clarence A. Cotton, Providence, R. I.
Group meeting on "Membership Campaigns"
Chairman: T. J. Appleyard, Jr., Piqua, Ohio

THE PROPER PLACE OF INDUSTRIAL DEVELOPMENT IN THE WORK OF A COMMERCIAL ORGANIZATION
Speaker: Ralph H. Faxon, Des Moines, Iowa
Leaders of Discussion:
George H. Mosser, Newark, Ohio
James R. Kinsloe, La Crosse, Wis.
Group meeting on "Factors in Securing Factories"
Chairman: Dennis F. Howe, Utica, N. Y.

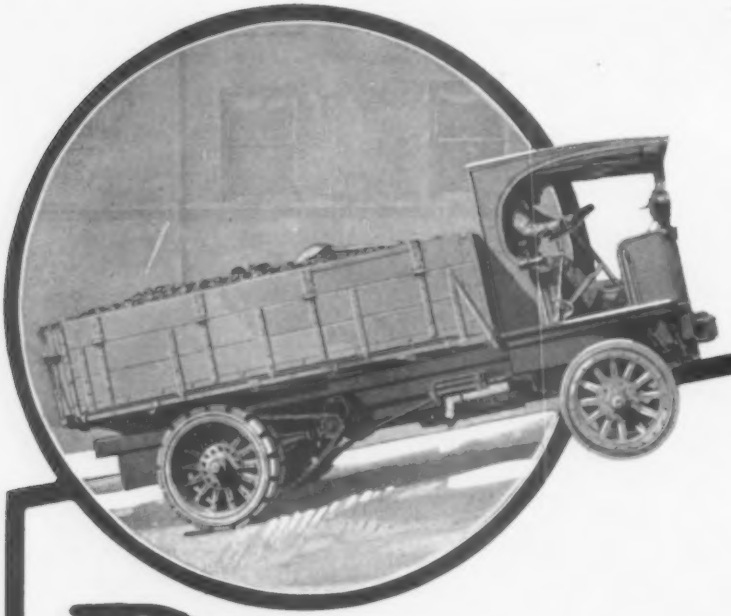
THE SMALL TOWN COMMERCIAL ORGANIZATION—WHAT CAN IT DO?
Speaker: Joseph F. Leopold, Athens, Ohio
Leaders of Discussion:
Charles E. Coyne, Holyoke, Mass.
Raymond B. Gibbs, Lockport, N. Y.
G. W. Lemon, Johnstown, Pa.

ORGANIZATION SERVICE FOR THE RETAILER
Speaker: Lee H. Bierce, Grand Rapids, Mich.
Leaders of Discussion:
William A. Searle, Rome, N. Y.
Louis E. Deuble, Canton, Ohio
Ralph B. Sullivan, Columbus, Ohio
Group meeting on "How to Serve the Retail Merchant"
Chairman: Walter H. Reed, Racine, Wis.

TRANSPORTATION PROBLEMS—HOW SHALL THEY BE DEALT WITH?
Speaker: D. P. Chindblom, Rochester, N. Y.
Leaders of Discussion:
N. B. Kelly, Philadelphia, Pa.
W. E. Holmes, Sioux City, Iowa
J. David Larson, Salt Lake City, Utah
Group meeting on "Relation with the Railroads"
Chairman: Walter S. Whitten, Lincoln, Neb.

TRADE EXTENSION TRIPS—METHODS AND RESULTS
Speaker: Leroy M. Gibbs, Oklahoma City, Okla.
Leaders of Discussion:
Robert H. Manley, Omaha, Neb.
Irving C. Norwood, Davenport, Iowa
E. C. Hillweg, Minneapolis, Minn.
No group meeting on this subject

SELF-EDUCATION OF THE SECRETARY
Speaker: Arthur J. Dodge, Denver, Colo.
Leaders of Discussion:
Paul T. Cherington, Boston, Mass.
John Wood, Roanoke, Va.
Walter G. Cooper, Atlanta, Ga.
No group meeting on this subject



Power!

POWER—crushing, tireless, irresistible *power* is personified in the Garford Motor Truck.

From the lighter one-ton Garford to the big six-ton model, *power* is pre-eminent—*power* that is well nigh silent—*power* that is easily handled—yet *power* so great that your motor truck is master of every situation.

Garford *power* is responsible for the wonderful feats that Garford motor trucks are performing everywhere—as daily routine.

Garford *power*—properly balanced—has won a wonderful reputation for Garford trucks.

Garford *power*—perfectly controlled—has put Garford motor trucks in places where "the impossible" must be accomplished—and Garford motor trucks have "produced."

Let the Garford dealer in your locality show you through which model this tremendous *power* can best be utilized in *your* business. And in the meantime address Dept. 203 for our descriptive literature.

Garford MOTOR TRUCKS

The Garford Motor Truck Company, Lima, Ohio

Manufacturers of Motor Trucks of 1, 1½, 2, 3½, 5 and 6 ton capacity
4½, 7 and 10 ton Tractors
The Garford Road Builder
Distributors and Service Stations in all Large Cities

When writing to Advertisers please mention THE AMERICAN CITY.

STIMULATING THE ORGANIZATION MACHINERY
Speaker: John M. Tuther, Memphis, Tenn.
Leaders of Discussion:
A. V. Snell, Charleston, S. C.
Ernest N. Smith, Indianapolis, Ind.
No group meeting on this subject

GROUP MEETINGS NOT ALLIED TO PROGRAM SUBJECTS

SECURING AND ENTERTAINING CONVENTIONS
Chairman: J. Lee Barrett, Detroit, Mich.

HOW FAR DOES THE MODERN COMMERCIAL ORGANIZATION REPRESENT THE PEOPLE OF THE COMMUNITY?
Chairman: Vincent S. Stevens, Akron, Ohio

BUDGETS AND ORGANIZATION EXPENDITURES
Chairman: F. G. Saxton, Toledo, Ohio

AGRICULTURAL AND COMMERCIAL COÖPERATION
Chairman: Not decided

The program represents the composite views of the full membership, who were canvassed by a questionnaire immediately following the last convention. The questionnaire was conducted by the Program Committee, who built up a program from the replies, incorporating other good ideas which they had. The Board of Directors applied the finishing touches. The result is a program that will interest every secretary, no matter how long he has been engaged in commercial organization work.

The criticism of former years against lengthy papers and too short discussions has been met. Two papers at each morning and afternoon session insure ample time for discussion, and every secretary is asked to come to the meeting prepared to discuss the subjects of most interest to him.

The entertainment provided will include a Ways and Means Committee luncheon at the Chicago Association of Commerce, a moonlight ride on Lake Michigan, an automobile ride over Chicago's boulevards and thru its parks, and the regular annual dinner of the National Association of Commercial Organization Secretaries.

Additional information about these conventions can be secured from Elliot H. Goodwin, Secretary of the Chamber of Commerce of the United States, Washington, D. C., and J. M. Guild, Secretary of the National Association of Commercial Organization Secretaries, at Dayton, Ohio.

The Ohio Public Health Campaign and Exhibit

COLUMBUS, OHIO.—The Ohio State Board of Health has been holding a series of interesting and valuable health exhibitions thruout the state. The first public health exhibition and campaign which the department ever held was launched in 1913 at the Ohio State Fair. Since that time the exhibit has been shown in seventy of the eighty-eight counties in Ohio. Among the cities in which it has been on display are Toledo, Zanesville, Fremont, Springfield, Bellefontaine, Oxford and Port Clinton. A photograph of the exhibit which was on display in Toledo is reproduced herewith.

The purpose of the exhibit is to instruct the people concerning the preventable diseases that are prevalent in the state, with

PUBLIC HEALTH EXHIBIT OF THE OHIO STATE BOARD OF HEALTH, SHOWN IN THE LOBBY OF THE NICHOLAS BUILDING, TOLEDO

BLAZING TRANSPORTATION TRAILS WITH THE DUPLEX

MORE than half the Duplex 4-Wheel Drive trucks in operation today are hauling *capacity* loads—3½ tons—under conditions where other types of trucks have been unable to operate efficiently.

Duplex trucks have opened immense territories to motor truck transportation, with the resulting economies—and have made it possible for many mining companies, contractors, lumber operators, road builders, pit and quarry owners, turpentine operators, fuel dealers, manufacturers and jobbers to efficiently motorize for the first time—to replace their horse and mule teams with a *dependable* and *durable* motor truck—the Duplex.

No longer can the objection be offered: "I know that motor trucks are more economical and efficient than mules and horses, but we have practically no roads here. Motor trucks would be of no use to us because they can't haul loads over these trails."

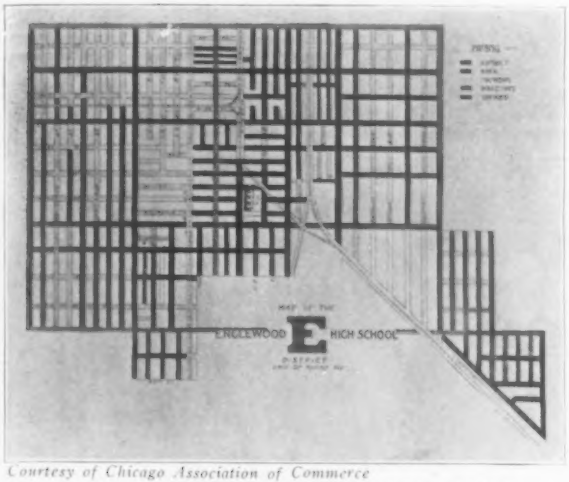
Duplex trucks have *demonstrated* time and again that they will *perform satisfactorily*—haul capacity loads—wherever horse and mule teams can be used. They are in daily operation on desert trails, sandy roads in southern turpentine states, mountainous districts in the West, slippery clay roads with steep hills and hub-deep mud—throughout the country Duplex trucks are blazing and pioneering transportation trails.

Duplex trucks are designed and constructed for heavy haulage work under adverse road conditions. The exclusive application of the Duplex 4-wheel drive principle makes it possible for this super-strength truck to not only perform titanic haulage tasks, but to *reduce haulage costs* to the absolute minimum

Duplex simplicity of design and exclusive mechanical features are described in detail in our new catalog, which will be mailed upon request. If you are interested in lowering your haulage costs, our engineers will send you facts and figures for your particular business.

Address all communications to Department 13C.

DUPLEX TRUCK COMPANY
LANSING, MICHIGAN



Courtesy of Chicago Association of Commerce

PAVING SURVEY BY ENGLEWOOD HIGH SCHOOL

their causes and extent, and to suggest approved methods for their prevention. Complete prevention, it is felt, lies only in the education of the people on these subjects. The Department has made generous use of aphorisms, charts, diagrams, maps, cartoons, photographs, models, electrical illusions and various mechanical devices to attract the eye and interest the visitor.

The scope of the exhibit covers the insanitary and unhygienic conditions which cause disease; the cause, extent, cure and prevention of tuberculosis, occupational diseases, infant mortality and ophthalmia neonatorum; the proper care of water, sewage, milk, air, food and proper housing conditions.

The State Board of Health transports the exhibit from place to place, leaving the local expenses to be met by the organization, company or group of citizens requesting the exhibit. The expenses usually do not exceed $25, and are for the rent, heating and lighting of the exhibition hall; the hauling of the exhibit to and from the baggage car; labor to assist the exhibit manager in setting up and taking down the exhibit; the printing of the date and place of holding the exhibit and other local information upon handbills and window cards which are furnished by the State Board of Health. Other expenses may possibly arise, depending upon local conditions.

The exhibit usually remains in a community four days. A lecture by an expert on some phase of public health work is given each evening. The lectures are illustrated by stereopticon slides and supplemented by motion pictures. The exhibition manager carries his own stereopticon and motion picture machine, with an operator and a fireproof booth.

In addition to the evening lectures, talks are given by the public health nurse who travels with the exhibit before women's clubs and similar organizations, or in the schools, upon invitation.

H. J. SOUTHMAYD,
Director of Exhibits, Ohio State Board of Health.

+ +

Chicago's "City Desirable" Survey

CHICAGO, ILL.—Several months ago the Chicago Association of Commerce invited the Civic Industrial Clubs in the Chicago high schools to conduct for it a "City Desirable" survey. The object of the survey was to obtain from each club a collection of data, with photographs, maps, charts, etc., concerning the desirable features of its community, such as parks, public buildings, business establishments and homes.

Eleven clubs submitted reports to the Association of Commerce. The material was displayed at the Art Institute, and, because of the wide latitude given the workers, a great variety of exhibits resulted. Each of the schools, in fact, brought out interesting data about its community.

Austin illustrated the physical appearance of its community, including the growth of its school and local population; Bowen concerned itself largely with the industrial development of its community and the need for parks; Englewood covered several phases, such as the transportation facilities, paving and school growth; Flower specialized on architecture and submitted photographs illustrating the different types; Hyde Park indicated the kinds of buildings and business of the blocks adjacent to its school; Marshall showed its district as having an abundance of parks and trees, with well-defined manufacturing and residence zones; McKinley dealt with the educational

GMC
GENERAL MOTORS COMPANY
TRUCKS

The All Purpose GMC Truck

— *ideally adapted to municipal work*

In park and street maintenance, in carrying supplies for water and light departments, in police, fire and health service —*in practically every phase of city activity*—this ¾ ton GMC excels.

With special body for any need, it offers that dependability of performance which shortly pays back its original cost. Its reinforced frame, sturdy motor, minimum complication of parts make it able to cope with difficult conditions of travel—reduce depreciation and repair.

Behind this GMC all purpose truck is one of the oldest and soundest truck factories. It is one in a family of six models ranging in all practical sizes from ¾ to 5 ton capacities— all of which come up to the GMC standard in sturdiness and dependability of performance. Let your dealer furnish facts and figures, or write TRUCK HEADQUARTERS.

GENERAL MOTORS TRUCK CO.
One of the Units of the General Motors Company
PONTIAC, MICHIGAN (242)

GMC
GENERAL MOTORS COMPANY
TRUCKS

and medical advantages of its community and the institutions that serve its people, and also prepared an industrial map and one illustrating the various types of architecture that can be found near the school; Medill emphasized the social and civic improvements. The chart prepared by Englewood High School, showing the result of that school's paving survey, is reproduced herewith.

ROBERT B. BEACH,
Acting Business Manager, Chicago Association of Commerce.

Uncle Sam Asks You to
THINK
Before you ask a merchant to make a delivery,
Send you goods on approval
Make an exchange,
Ask yourself
IS IT NECESSARY?
All these services are expensive. And ultimately YOU must pay for them.
If the service is not necessary, you are not only wasting your own money but the resources of the country.
UNCLE SAM ASKS IT—STOP AND THINK
CARRY IT HOME
—THE CHAMBER OF COMMERCE.

MARIETTA'S ECONOMY APPEAL

+ +

Why Not Carry It Home?

MARIETTA, OHIO.—The Marietta Chamber of Commerce is conducting a campaign for the elimination of unnecessary and useless service on the part of the retail merchant. It has undertaken this campaign at the request of the Council of National Defense. No attempt is being made to curtail any legitimate service, but the public is being educated to carry home those two spools of thread and not to ask for unnecessary exchanges of merchandise, or other expensive and needless accommodation. Altho the campaign in Marietta has been running only a short time, the results have been very good and the merchants are enthusiastic.

One of the newspaper advertisements which is being used in the campaign is reproduced herewith.

J. D. CHAMBERLAIN,
Managing Secretary, Marietta Chamber of Commerce.

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Good Roads for Wichita County

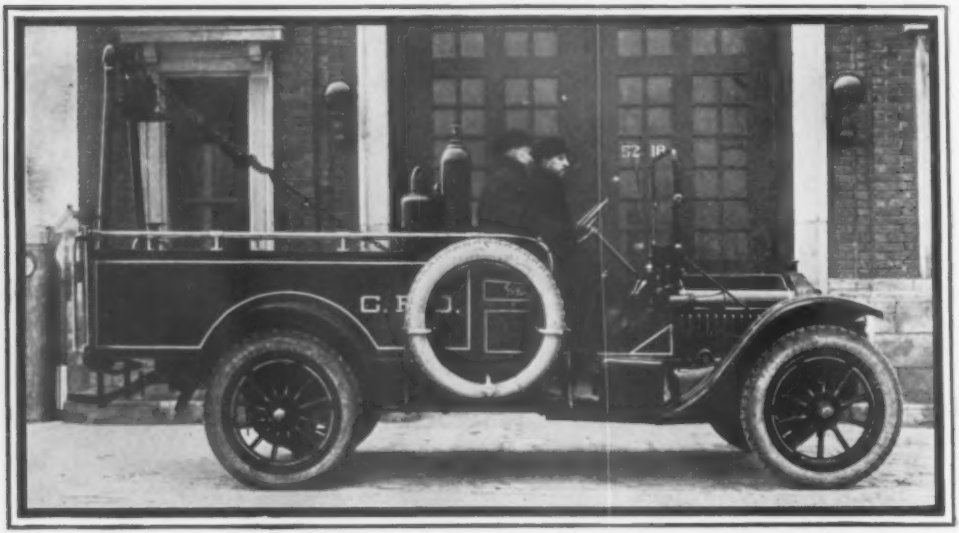
WICHITA FALLS, TEX.—The civic work of the Chamber of Commerce and the Motor Club of Wichita Falls has made possible the building and maintenance of roads in an entire county thru the $750,000 good roads bond issue which was carried in Wichita County in May. In addition to being a civic accomplishment, the passage of the bonds constituted a hearty response to the administration's plea for "business as usual."

Wichita Falls is the county seat of Wichita County. The roads in Wichita County are the average Texas roads, which means not very good roads as roads are known in the North, the East and the West. The county is traversed by two national highways, the Meridian Road and the Colorado-to-the-Gulf Highway. The members of these two road organizations, who are also members of the Chamber of Commerce and of the Motor Club, bent their efforts toward improving their own county roads after they had seen really good roads in other counties and other states.

When the issue was first agitated, it developed that the sentiment in the country was about even, while in town the bonds had a trifle better prospect. A two-thirds majority was necessary to carry the election, and the two civic organizations set about to get this two-thirds. They organized a campaign committee with the secretary of the Chamber of Commerce as manager. The committee created a campaign fund by selling buttons reading "Be a Good Roadster" at $1 each. One thousand of them were sold at that price.

A card index was made of all the voters in the country, and their opinions in regard to the bond issue were ascertained. Those who were on the wrong side were promptly converted. The greater part of the opposition was due to the fear that the bond issue would mean a much higher rate of taxation. Figures had been compiled, how-

WHITE TRUCKS



New Type of Truck for Fire Department Service

THE Chicago Fire Department is using a specially designed White Truck for making quick repairs to apparatus actually in service at fires, towing equipment to repair shops, clearing up wreckage and obstructions, and other phases of emergency work.

Since its installation six months ago the truck has been on the road twenty-four hours a day and three crews of men are required to operate it.

Attached to the rear frame is a chain hoist. In the body is a jack capable of lifting twenty tons. A special towing attachment having a coil spring drawbar makes it easy for this comparatively small truck to pull heavy pumping engines, hook and ladder trucks and other heavy apparatus. Compartments along the sides are for carrying tools of every description, including a strong vise.

Two steel tanks are provided for oxyacetylene welding of parts, the cutting of steel bars, plates and other metal. This work is done by an attendant who is an experienced mechanic and an expert welder. For further details write to

THE WHITE COMPANY
CLEVELAND

Largest Manufacturers of Commercial Motor Vehicles in America

ever, to show that the interest on $750,000 and the annual payments would amount to but $56,500, which is much less than the $68,000 that had been required yearly to maintain the dirt roads. The $750,000 asked for would enable permanent roads to be built, provide $8,000 annually for their upkeep, and still leave money with which to maintain the few miles of side roads remaining, without any increase in taxation.

A "Good Roads Bulletin" was published, containing arguments in favor of building permanent highways; stories from counties where bond issues had been voted; endorsements from citizens in all walks of life and the reasons for them; and data showing the cost of permanent roads as compared with the upkeep of dirt roads. A folder containing a stamped, addressed post card to be returned to the Good Roads headquarters was mailed to every voter, asking that he write the committee how he stood on the bonds, and his reasons. Another method used to get converts that proved very effective was that of sending "missionaries" into every part of the county to visit each voter personally and present telling arguments to him.

Some people expressed the opinion that it would not be wise to vote for the bonds now because the war would make money scarce, and money should not be spent upon roads when there might not be enough food later on. To these it was explained that the money which will be spent on the roads would be procured from outside at a low rate of interest, that it would be circulated in the county in payment for labor and for materials, and that this extra money coming into the community would be a boon in case hard times should come because of the war. This argument and various other methods of persuasion converted many to the "gospel of good roads" preached so earnestly by the Chamber of Commerce and the Motor Club, with the result that on election day the vote stood 1,648 for and 410 against the bonds. They are forty-year bonds, and may be redeemed, if desired, at the end of ten years; they bear interest at five per cent.

PAULINE MEARS,
Of the Publicity Department, Wichita Falls Chamber of Commerce.

A School for Merchants

HOBOKEN, N. J.—With a desire to comply with the request of President Wilson that there be proper distribution and conservation of foodstuffs and clothing in these war times, the Hoboken Board of Trade in May organized a Merchants' Institute in which the merchants "went to school" for three days and nights. They were taught the merchandizing principles that would enable them to operate with profit, to give superior service to their customers, and at the same time to sell their wares at a lower price.

Retail problems had presented themselves recently in Hoboken which the Retail Bureau of the Board of Trade was determined to solve, if possible. The interests of both the buying public and of the merchants needed to be safeguarded. The war had caused unusual conditions to arise which were very much aggravated by the false idea of economy that had spread over the country and that had begun to injure both the merchants and the manufacturers.

A survey of all the retail stores was decided upon, and it was planned to "treat" every retail business in the city, cutting away a needless appendix here and applying a stimulant there. A "Merchants' Clinic" was opened in which all the merchants were invited to participate. The doctor-teacher was James W. Fisk, Manager of the Retail Service Department of the Associated Advertising Clubs of the World, who is thoroly versed in the art of diagnosing retail diseases and applying the proper remedy.

The opening day of the clinic was spent in making a survey of the stores. This was made by Mr. Fisk and a committee of merchants. The arrangement of the stock, the window displays, the advertising, the service given to customers, the policy of the store as to "mark-up," "mark-down," "special sales," "turn-over," the method of buying,—in short, every feature of the business was scrutinized. There were merchants who did not know whether they enjoyed one "turn-over" a year or whether ten years were required. Some stores catered to an entirely different class of trade from that which really sustained them, with a resultant holding down of their sales. The investigation of Mr. Fisk disclosed many ills that had caused the merchants worry and loss of money and lessened their service to

TO check the spread of a fire two things are absolutely necessary. First, an ample water pressure; and secondly, a dependable hose.

"White King" Fire Hose

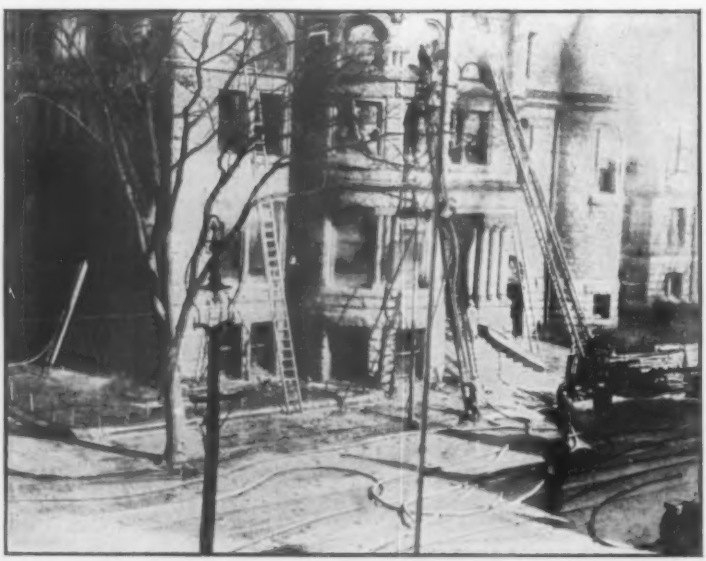
is today in use in hundreds of municipalities—because it can be depended on when property and life are at stake. With even the best water supply a weak hose is for all practical purposes only a gambling device. You cannot be sure just when a bursting hose will defeat your best efforts.

Goodrich-made hose costs less in the long run because it outlasts all the rest. Let us tell you why. Write us.

THE B.F. GOODRICH COMPANY

Makers of the Celebrated Goodrich Automobile Tires—
"Best in the Long Run"

Factories: AKRON, OHIO Representation Everywhere



customers, and had caused even increased prices to customers.

The evening classes were for the merchants and the salespeople. The lessons taught were not theoretical; the practical side of business was always presented. The merchants were told that profit resulted from proper advertising; that no store ever prospered without good-will; that it was the "repeats" that caused a store to grow; that salesmanship required real intelligence; that there was dignity in labor, and many other truths which greatly changed the viewpoints of the merchants and the clerks. The clerks were instructed how to make two sales where only one had been made before; how to sell the better grade and higher priced merchandise; and the merchants were trained in the art of so placing their wares that they would sell themselves.

One of the remarkable features of the Institute was its effect upon the false economy hysteria. For two weeks previous to the holding of the Institute the sales had fallen far below the average. Hoboken was no more unfortunate in that respect than other cities, but was determined to defeat the false economy propagandists, and it was more than a coincidence that the sales became reasonably normal during the period the Institute was in session and have continued good since. The merchants feel that the publicity occasioned thereby allayed the fears of the buying public and caused a resumption of the usual buying. At any rate, the "bugaboo" has been routed and wares are now being removed from the shelves with the usual speed.

Hoboken's success in handling its problems appealed to the rest of New Jersey, and representatives from ten or more towns, as well as from the New Jersey State Chamber of Commerce, met at the Hoboken Board of Trade and promoted a plan for organizing a State Bureau of Retail Affairs, to be managed by the State Chamber of Commerce, which will be able to secure immediate action on common problems in the various cities and towns of the state. These other cities are planning similar Institutes so that their stores may be put upon a war-time basis, and it is believed that before many months have passed New Jersey retail interests will be properly and thoroly organized.

ROSCOE D. WYATT,
Managing Secretary, Hoboken Board of Trade.

New Bulletins

CIRCLEVILLE, OHIO.—*Chamber of Commerce News*, the official publication of the Chamber of Commerce.

DALLAS, TEX.—*The Dallas Survey*, a journal of social work issued semi-monthly by the Civic Federation of Dallas.

JACKSONVILLE, FLA.—*Jacksonville Energy*, the official publication of the Jacksonville Chamber of Commerce, to be issued monthly.

JOLIET, ILL.—The *Bulletin* of the Joliet Association of Commerce, to be issued monthly.

KANSAS CITY, KAN.—*Events*, the official publication of the Kansas City Chamber of Commerce.

LOUISIANA, MO.—*Commercial Club Doings*, published monthly by the Louisiana Commercial Club.

LUBBOCK, TEX.—*Official Organ* of the Lubbock Chamber of Commerce.

ROCK ISLAND, ILL.—*The Rock Island Accelerator*, published by the Citizens' Committee of the Chamber of Commerce.

Recently Issued Printed Matter

LA CROSSE, WIS.—The year book of the La Crosse Chamber of Commerce, entitled "One Year's Service."

"What the Chamber of Commerce Can Do for La Crosse" is the title of a four-page leaflet also issued by the La Crosse Chamber of Commerce.

MCKEESPORT, PA.—"What It Has Done and What It is Doing for McKeesport" is the title of a folder issued by the McKeesport Chamber of Commerce, in which are enumerated the last two years' activities of the Chamber.

NEW YORK CITY.—The American Institute of Social Service (address, Astor Place, New York City) has drawn up a War-Time Community Program to meet the needs of local communities who are anxious for an opportunity to express their devotion to the nation. It was prepared under the leadership of Robert A. Woods, president of the National Conference on Social Work (formerly National Conference of Charities and Correction), with the advice and assistance of experts from several sections of the country. It is believed that the widespread publication of the program will help to clarify the thoughts and direct the impulses of the men and women who initiate and control local forward movements.

NEW YORK CITY.—"What the Traffic and Industrial Bureaus Accomplished During the Past Year" is the title of a four-page leaflet issued by the Chamber of Commerce of the Borough of Queens.

NEW YORK CITY.—"The City Association Among Industrial Workers" is the title of a booklet issued by the International Committee of Young Men's Christian Associations, located at 124 East Twenty-eighth Street. It tells about the organized industrial extension work which the Association is conducting in

United States, Nobby Tread Tires

Rolling to a long distant first or second, you Fire Chiefs and your light apparatus drivers want the **best** tire assurance.

United States "Nobby" Treads will stand the test of fast corners—and any or all of the other severe service tests—at a mileage cost so low it will astonish you.

Specify United States "Nobby" Tread Tires and you'll roll in satisfaction.

United States Tire Company
1790 Broadway, New York
'Nobby,' 'Chain,' 'Usco,' 'Royal Cord,' 'Plain'
Made by the Largest Rubber Manufacturer in the World

The Anderson Coupling & Fire Supply Company
KANSAS CITY, KANSAS
Manufacturers of
MOTOR FIRE APPARATUS
General Fire Department Supplies
Anderson-Hale Fire Station Door Openers
Estimates Cheerfully Given

Loper Fire Alarm Co.
STONINGTON, CONN.
Manufacturers of
Compressed Air Fire Whistles
Whistle Blowers
Bell Strikers, Boxes, Gongs
Etc., Etc.
Estimates Cheerfully Given

ORANGEBURG FIBRE CONDUIT

Easily Stored Book "D" Easily Installed
THE FIBRE CONDUIT COMPANY, Orangeburg, N. Y.
New York Boston Chicago San Francisco

Paint economy is not the price paid but the number of years of service given. Consider
DIXON'S SILICA GRAPHITE Paint
when buying a paint. It has unusual qualities for protecting all kinds of exposed metal and wood work against gases, acids, corrosion, dampness and other deteriorating agents. *Write for Booklet No. 107-B.*
Made in JERSEY CITY, N. J., by the
JOSEPH DIXON CRUCIBLE CO.
Established 1827

the cities thruout the country and contains numerous illustrations of the activities.

NEW YORK CITY.—"Campaigning Against Industrial Evils" is the title of a bulletin issued in June by the Consumers' League of New York City. "This issue is intended to point out the grave tendency to relax industrial safeguards in war time and to show the necessity not merely of maintaining but of strengthening present standards."

NEW YORK CITY.—The Nineteenth Year Book of the People's Institute of New York, Edward F. Sanderson, Director.

SAULT STE. MARIE, MICH.—The annual report of the Sault Ste. Marie Civic and Commercial Association for the year June, 1916, to June, 1917, has been issued and is ready for free distribution.

WASHINGTON, PA.—The Year Book of the Washington Board of Trade for the year ending June 5, 1917.

HONOLULU, H. I.—The annual report of the Chamber of Commerce of Honolulu for the year ending December 3, 1916, has been published.

Some Coming Conventions

SEPTEMBER 5-8.—GARY, IND.
League of American Municipalities. Annual convention. Secretary, Robert E. Lee, Mayor's Office, Baltimore, Md.

SEPTEMBER 10.—NEW YORK CITY.
Fourth International Exposition of Safety and Sanitation. Under the auspices of the National Safety Council and the American Museum of Safety, at Grand Central Palace. The fourth annual safety congress of the National Safety Council will be held in conjunction with the International Exposition of Safety and Sanitation. Secretary National Safety Council, W. H. Cameron, 208 La Salle Street, Chicago.

SEPTEMBER 11-13.—ST. LOUIS, MO.
American Association of Park Superintendents. Annual convention. Secretary, Roland W. Cotterill, 533 City Hall, Seattle, Wash.

SEPTEMBER 11-14.—CLEVELAND, OHIO.
American Association of Port Authorities. Annual convention. Secretary, William Joshua Barney, 29 Broadway, New York City.

SEPTEMBER 11-14.—NIAGARA FALLS, N. Y.
International Association of Municipal Electricians. Annual convention. Secretary, Clarence R. George, Houston, Tex.

SEPTEMBER 11-15.—HARTFORD, CONN.
New England Water Works Association. Annual convention. Secretary, Willard Kent, Narragansett Pier, R. I.

SEPTEMBER 12-13.—HOULTON, ME.
Maine State Board of Trade. Annual meeting. Secretary, Edward M. Blanding, Bangor, Me.

SEPTEMBER 17-21.—ATLANTIC CITY, N. J.
Chamber of Commerce of the United States. War convention. General Secretary, Elliot H. Goodwin, Riggs Building, Washington, D. C.

SEPTEMBER 18-20.—IOWA CITY, IOWA.
League of Iowa Municipalities. Annual convention. Secretary, Frank G. Pierce, Marshalltown, Iowa.

SEPTEMBER 18-20.—LYNCHBURG, VA.
League of Virginia Municipalities. Annual convention. Secretary, L. C. Brinson, Portsmouth, Va.

SEPTEMBER 19-20.—CALGARY, ALBERTA.
Union of Alberta Municipalities. Annual convention. Secretary, J. D. Saunders, Camrose, Alta.

SEPTEMBER 24-26.—CHICAGO, ILL.
National Association of Commercial Organization Secretaries. Annual convention. Secretary, John M. Guild, Greater Dayton Association, Dayton, Ohio.

SEPTEMBER 24-28.—SANTA ROSA, CAL.
California Conference on City Planning. Annual conference. Secretary, Charles H. Cheney, Crocker Building, San Francisco, Cal.

SEPTEMBER 24-29.—SANTA ROSA, CAL.
League of California Municipalities. Twentieth annual convention and Public Welfare Exposition of municipal machinery and supplies. Executive Secretary, W. J. Locke, Bureau of Municipal Reference, Alameda, Cal.

SEPTEMBER 25-27.—COLUMBUS, OHIO.
Smoke Prevention Association. Annual convention. Secretary, Frank A. Chambers, City Hall, Chicago, Ill.

SEPTEMBER 25-27.—RACINE, WIS.
League of Wisconsin Municipalities. Annual convention. Secretary, Ford H. MacGregor, Madison, Wis.

SEPTEMBER 27-28.—OTTAWA, ONT.
Canadian Public Health Association. Annual congress. General Secretary, J. G. Fitzgerald, M. B., Toronto, Ont.

OCTOBER 10.—DUNCAN, B. C.
Union of British Columbia Municipalities. Annual convention. Secretary, Ex-Reeve H. Bose, Surrey Center, B. C.

OCTOBER 12-13.—WENATCHEE, WASH.
Washington Association of Commercial Organizations. Annual convention. Secretary, P. E. Magruder, Chamber of Commerce, Bellingham, Wash.

OCTOBER 15-17.—CHICAGO, ILL.
National Housing Association. Annual meeting. Secretary, Lawrence Veiller, 105 East Twenty-second Street, New York City.

OCTOBER 16-19.—WICHITA, KAN.
League of Kansas Municipalities. Annual convention. Secretary, C. H. Talbot, University of Kansas, Lawrence, Kans.

OCTOBER 17-18.—ST. CLOUD, MINN.
League of Minnesota Municipalities. Annual convention. Executive Secretary, E. L. Bennett, University of Minnesota, Minneapolis, Minn.

OCTOBER 17-19.—WASHINGTON, D. C.
American Public Health Association. Annual meeting. Acting Secretary, A. W. Hedrick, 126 Massachusetts Avenue, Boston, Mass.

OCTOBER 18.—HARTFORD, CONN.
Connecticut Chamber of Commerce. Annual convention. Secretary, A. H. Andrews, Board of Trade, New Bedford, Mass.

OCTOBER 22-24.—ST. LOUIS, MO.
American Civic Association. Annual convention. Secretary, Richard B. Watrous, 914 Union Trust Building, Washington, D. C.

NOVEMBER 19-24.—DETROIT, MICH.
City Managers' Association. Annual convention. Secretary, Winton L. Miller, City Manager, St. Augustine, Fla.

NOVEMBER 20-23.—(PLACE UNDECIDED.)
Playground and Recreation Association of America. Annual recreation congress. Secretary, H. S. Braucher, 1 Madison Avenue, New York City.

NOVEMBER 21-24.—DETROIT, MICH.
National Municipal League. Annual meeting. Secretary, Clinton Rogers Woodruff, North American Building, Philadelphia, Pa.

The AMERICAN-LaFRANCE

There are Upwards of 1500 Pieces of American LaFrance Motor Fire Apparatus in Service

There is a Piece of American LaFrance Apparatus Responding to an Alarm Approximately Every Minute of the Day

AMERICAN-LaFRANCE FIRE ENGINE COMPANY, INC.

Elmira, New York, U. S. A.

Members of the National Automobile Chamber of Commerce
Licensed under the Dyer patents.

Annual Fire and Accident Prevention Day

FOLLOWING the successful precedent previously established, the announcement has gone forth that "Fire and Accident Prevention Day" will be celebrated this year on Tuesday, October 9. Municipal officials, Chambers of Commerce and other individuals and organizations are urged to work together to make this year's observance a memorable one.

Last year celebrations were widespread throughout the country. All states, save eleven, participated. The successful Rochester, N. Y., celebration was directed by the Rochester Chamber of Commerce, with one international and four national associations coöperating with numerous local organizations. A Public Fire and Accident Prevention show was the feature in Rochester. It included addresses, a fire prevention film, "The Locked Door," an accident prevention film, "The House That Jack Built," and a humorous film featuring the well-known stars, "Krazy Kat and Ignatz Mouse."

Those interested in organizing for Fire and Accident Prevention Day observance in their communities should write to Mr. Franklin H. Wentworth, Secretary, National Fire Protection Association, 87 Milk Street, Boston, Mass., for a copy of that Association's interesting committee report on "Fire and Accident Prevention Day."

Municipal and Civic Publications

TOWN PLANNING INSTITUTE, 4 Arundel Street, London, W. C.

Papers and Discussions, 1915-1916. 185 pp. Photographs, charts, diagrams and maps. **$1.50** (duty extra)

Among the men who delivered papers or engaged in the discussions of the Town Planning Institute in 1915-1916 are some of the best-known English town planners. These papers and discussions are published in a volume recently issued by the Town Planning Institute, and a goodly number of maps, diagrams and photographs are reproduced which add considerable perspicuity. Prof. Patrick Abercrombie has a valuable article on "Town Planning Literature," in which he indicates many sources of knowledge not hitherto known generally; James Crossland contributes a careful study of "The Placing, Design and Arrangement of Railway Terminals," and W. R. Davidge's article on "Arterial Roads in Greater London" will be of much interest to the professional city planner, as it contains a great deal of material which only diligent research would otherwise reveal. Other articles are: "Town Planning Schemes and Open Spaces," by Lawrence W. Chubb; "The Town Planning Proposals of the Urban Land Reports," by H. R. Aldridge; "Width and Allocation of Space in Roads," by F. Longstreth Thompson; "Horizontality and Verticality in the Architectural Treatment of Town Planning Schemes," by Barry Parker; "Limited Owners and Town Planning," by J. Stanwell Birkett. Other matters of concern to members is included. The publication of this volume means the addition of one more of those painstaking professional treatises which are helping so much to advance the science of town planning.

BOURNE, RANDOLPH.

Education and Living. 1917. x + 236 pp. **$1.25**

Mr. Bourne, whose brilliant book on "The Gary Schools" was reviewed in the August, 1916, issue of THE AMERICAN CITY, presents in this book a series of constructive studies of the methods and attitudes existing and emerging in our school and college system. The book maintains that the problem of American education is to transform an institution into a life, educating the individual up to his capacity and releasing the vital energies that go to waste under the present repressive system. Some of the subjects treated are: The Wasted Years, The Cult of the Best, Schools in Gary, Apprentices to the School, An Issue in Vocational Education, The Organic School, Medievalism in the Colleges, and Educating the Educators.

MASSACHUSETTS STATE DEPARTMENT OF HEALTH, Allan J. McLaughlin, Commissioner of Health.

First Annual Report of the State Department of Health of Massachusetts, 1915. (Apply to the Publication Office, State House, Boston, Mass.)

This first report of the reorganized State Board of Health retains many of the features of the older reports, particularly as to form. Among the particular features of interest to municipal and county officials are the sections on "Advice to Cities and Towns" which have been maintained by the older organization and continued by the new. Any city or town in Massachusetts or any civic organization may ask advice on matters pertaining to the health of the community and receive adequate advice from the state authority. The practice of annual or semi-annual chemical analyses of the water supplies of the state is maintained and furnishes a very complete record of the condition of supplies thruout the state. Considerable space is given to the disposal of sewage by dilution, a practice still in vogue in many of the coast cities of Massachusetts because of its economy. The justly famous reports of the Lawrence Experiment Station, which has been in active service so long, are continued with a discussion of the fertilizing value of sewage sludge and the stabilizing of sludge by oxidation. In the water experimental work there are ample discussions of the sterilization of water by ultra-violet rays, liquid chlorine and bleach in comparison.

The work of the State Epidemiologist is reported at length and serves to show admirably the coöperation of the state and the city in checking the spread of epidemics.

Fire Fighters in Hawaii

HERE is shown part of the fire department of Honolulu. The entire department is equipped with Firestone solid tires which shows how the fire authorities in far-away Hawaii feel about the truck tire question as regards fire-fighting equipment.

Firestone TIRES

for Fire Apparatus, Motor or Horse Driven

In any climate, under all conditions, the vital power in Firestone rubber enables these tires to stand up under the strain of heavy loads at high speed. Its lively resilience prevents skid and absorbs vibration, protecting men and mechanism.

Consult the Firestone man. He is near and glad to serve. Write for catalog.

Firestone Tire and Rubber Company
Akron, Ohio — Branches and Dealers Everywhere

CHAPIN, CHARLES V., Superintendent of Health, Providence, R. I.

How To Avoid Infection. 1917. 88 pp. **55 cents**

This book is of interest to municipal officials, particularly those not connected with health departments, as it gives in non-technical terms the principal ideas and modes of infection, correcting many theories which are even now held by well-meaning citizens and officials. It deals a body-blow to the old idea that all filth transmits disease. The nature of carriers is described and also the mild case of disease, which is the most dangerous, because it is not suspected. It corrects the still existing, but erroneous, impression that fumigation is necessary after all cases of disease. It deals with sources of infection, such as handling food, which can be controlled thru the city ordinances. The old idea that hospitals are dangerous to a residential community is shown to be wrong. Antitoxins and vaccination are discussed and the "most serious of all human diseases," malaria, is shown to be easily checked if properly combated by the municipality. In closing, the book proclaims that "Science allays fear by substituting light for darkness."

AMERICAN SOCIOLOGICAL SOCIETY.

The Sociology of Rural Life. (Volume XI of the Publications of the American Sociological Society, Scott E. W. Bedford, Managing Editor.) 1917. vi + 233 pp. **$1.60**

This volume contains over a dozen excellent papers by authorities which should be of interest to all persons concerned with the problems of rural life. Some of the papers are as follows: "Countryside and Nation," by George E. Vincent; "Country Versus City," by Warren H. Wilson; "Folk Depletion as a Cause of Rural Decline," by Edward Alsworth Ross; "The Non-Partisan League," by Charles Edward Russell; "The Mind of the Farmer," by Ernest R. Groves; "The Development of Rural Leadership," by G. Walter Fiske; "The Land Problem and Rural Welfare," by Paul L. Vogt; "The Consolidated School as a Community Center," by John H. Cook; "Social Control: Rural Religion," by C. O. Gill; "Cooperation and Community Spirit," by A. D. Wilson; "Rural Surveys," by C. W. Thompson; "The Results of Some Rural Social Surveys in Iowa," by George H. von Tungeln; "The Scope and Methods of Instruction in Rural Sociology," by John M. Gillette; "The Teaching of Rural Sociology," by Dwight L. Sanderson.

NATIONAL INSTITUTE OF SOCIAL SCIENCES.

Journal of the National Institute of Social Sciences. Volume III, January, 1917. (Volume No. 49, Journal of the American Social Science Association.) Publication Committee: Lillie Hamilton French, Editor; Franz Schneider, Jr. 1917. 262 pp. **$1.60**

In its official capacity as standing for the application of scientific methods to the betterment of society, the National Institute of Social Sciences presents in this volume a number of interesting papers, among which are the following: "The Policemen of To-day," by Arthur Woods; "The National Research Council and the Mobilization of Our Research Resources in Science," by Maraton T. Bogert; "Some Problems in Prison Reform," by William J. Homer; "Vocational Guidance," by Lillian D. Wald; "Protecting Fifth Avenue," by Robert Grier Cooke; "The Borough of Manhattan," by Marcus M. Marks; "The Department of Water Supply, Gas and Electricity," by William Williams, etc.

PRICE, C. MATLACK.

The Practical Book of Architecture. 1916. 348 pp. Numerous photographic illustrations. **$6.35**

This book has two distinctly practical objects. It aims to teach how to distinguish the various principal styles of architecture and to show something of those styles, and it is designed for use as a practical guide to building for those who contemplate building their own houses, or who may be connected in any way with advisory boards for the erection of buildings of a more public character. From this latter aspect it should be of particular interest to readers of THE AMERICAN CITY and to members of local building committees, who do not feel they know as much as they should about good and bad architecture. Some of the chapter heads are as follows: (Part I), The Evolution of Architecture; The Classic Ideal; Byzantine, Romanesque and Gothic Derivations; English Derivations, Early and Modern; Latin Derivation in American Architecture; Native American Architecture. (Part II), The Selection of Location, Style, Material and Architect; Architect and Client; Materials and Construction; Plans and Details.

WESTON, ROBERT S., and TURNER, C. E.

Studies on the Digestion of a Sewage-Filter Effluent by a Small and Otherwise Unpolluted Stream. 1917. 96 pp. — X plates. **$1.00**

Sewage disposal by dilution is one of the large factors in coastwise cities, but its importance is also considerable for inland cities where the effluents from sewage treatment works must be disposed of into small streams. This pamphlet covers the investigation of the pollution of a small stream by the effluent of a plant which thoroly treats the sewage at Brockton, Mass.

All phases of the different factors which enter into the oxidation of the organic content of sewage are carefully considered, and it is found that the energetic action of certain plants and animals is of great importance in purifying streams receiving sewage effluents.

This is a very interesting and valuable pamphlet for any sewage engineer, particularly those dealing with sewage effluents which must be emptied into small streams.

FAXON, FREDERICK WINTHROP, A. B., Editor.

Annual Magazine Subject-Index, 1916. (Including as Part II The Dramatic Index, 1916.) 1917. 269 + 297 + 42 pp. **$8.90**

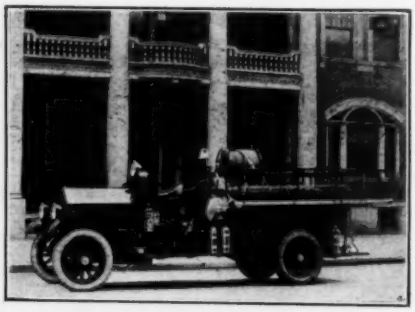
This volume furnishes a comprehensive subject-index to the less common American and English periodicals. While aiming to cover as many subjects as possible, certain fields are given special attention, as follows: History, Travel, Mountaineering, Exploration, Outdoor Life, Fine Arts, Architecture, etc. Readers of THE AMERICAN CITY will find of interest the references under such heads as Cities, Citizenship, City and Town Planning, City Government, City Halls, Civic Art, Civics, Community Welfare, Fire Prevention, Garbage Disposal, Gardens, Health, etc., etc.

WHIPPLE, GEORGE CHANDLER, Professor of Sanitary Engineering in Harvard University and the Massachusetts Institute of Technology; Member of the Public Health Council of the Massachusetts State Department of Health.

State Sanitation: A Review of the Work of the Massachusetts State Board of Health. Vol. I. 1917. xi + 377 pp. Portrait photographs and figures. **$2.50**

This book from the Harvard University Press is the first of a series of three volumes by the same author descriptive of the work of the Massachusetts Board of Health, which was reorganized in 1914 and became the State Department of Health. The present volume includes an admirable history of the activities of the State Board of Health and an abridged reprint of the "Report of the Massachusetts Sanitary Commission of 1850."

While this review may seem to be local in its value, it will have extensive use among the many followers of the work of the Board. It contains in its pages inspiration for the new class of workers, the municipal health officers, for the lives of eminent sanitarians recorded are examples of devotion to the cause of public health. This volume deserves wide circulation on its own merits, but accompanied by the reprints of valuable papers from annual reports long out of print and not available in any other form which are to make up the second volume, and the carefully prepared indices which form the third and last volume, it will become a report invaluable to health officials and all others who wish to consult the records of the Massachusetts State Board of Health, the pioneers of public health activities and sanitation in the United States.



City of Lapeer
R. F. FRAY, MAYOR

LAPEER, MICHIGAN. April 6'17

South Bend Motor Car Works
South Bend, Ind.

Attention Messrs.Mecklenburg & Scott.
Gentlemen:

I am writing this letter to let you know that you were about 24 hours early with your Munsey Committee, as last night Lapeer experianced the most disastrous fire ever known in her history.

An alarm was turned in at 6.30P.M. and we put the pumper to work immediately, drawing from the river. She did continuous service for about 8 hours and saved the city of Lapeer at least two valuable stores, amounting to a good many times the price of the entire equipment.

This morning our most radical knockers against the purchase of the machine frankly told me that the machine did not owe the city of Lapeer a cent.

It certainly did admirable and efficient service for 8 hours continuous work.

Very truly yours,

R. F. Fray
Mayor.

RFF/KB

—AND NOT ONLY IN LAPEER

but in every city where South Bend Double Duty Apparatus is installed. They perform that same efficient, conscientious service. They are dependable—and that's what counts in Fire Apparatus. Write us for booklets.

The South Bend Motor Car Works **South Bend, Ind.**

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ESTABLISHED 1885

Oil and Gasoline Storage Systems

Are preventative insurance policies that combine far reaching protective features. They protect the life, property and progress of every community where gasoline is used and stored; stop waste—Make your city cleaner, a more comfortable and satisfactory place in which to make your home.

Write for interesting literature—now.

S. F. Bowser & Co., Inc.

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SMITH, WALTER ROBINSON, Ph. D., Professor of Sociology and Economics, Kansas State Normal College, Emporia, Kan.

An Introduction to Educational Sociology. (Riverside Textbooks in Education, Edited by Ellwood P. Cubberley). 1917. xviii + 412 pp. **$1.85**

If the school is to continue assuming larger shares of the activities of youth there will be need for a more extensive and inclusive program of educational ideals and practices than we have adopted up to the present. In this work of expanding the field of public education sociology must take a leading part. To this end the author discusses sociology and its relation to education and the various aspects of educational sociology, under such heads as the Individual and the Social Group; Social Organization; Primary Social Groups; Evolution of the Modern School; Social and Educational Surveys; Vocational Aspects; Essentials of the Socialized School.

Pamphlets and Papers of Civic Interest

See also the department of News and Ideas for Commercial and Civic Organizations

Journal of the American Judicature Society.
Journal of the American Judicature Society to Promote the Efficient Administration of Justice. Vol. I, No. 1, June, 1917. Published monthly at West Lake Street, Chicago, Ill. 32 pp. (Apply to the American Judicature Society at above address.)

New York's General Highway Traffic Law.
An Act to Provide for Uniform Regulation of Vehicles, Animals and Pedestrians on any Public Highway in the State. Chapter 70 of the Consolidated Laws, General Highway Traffic Law. Approved by Governor, May 25, 1917. 12 pp. (Apply to Secretary of State, Albany, N. Y.)

Training Schools for Teachers in Wisconsin.
The Wisconsin County Training School for Teachers in Rural Schools. By W. E. Larson, States Rural School Inspector, Department of Education, Madison, Wis. Published by the Bureau of Education of the Department of the Interior as Bulletin, 1916, No. 17. 40 pp. (Apply Government Printing Office, Washington, D. C.)

Studies in Secondary Education.
The Social Studies in Secondary Education, a Six-Year Program Adapted Both to the 6-3-3 and the 8-4 Plans of Organization. Report of the Committee on Social Studies of the Commission of the Reorganization of Secondary Education of the National Education Association. Compiled by Arthur William Dunn, Secretary of the committee. Published by the Bureau of Education of the Department of the Interior as Bulletin, 1916, No. 28. 63 pp. (Apply to the Government Printing Office, Washington, D. C.)

Municipal Public Markets.
A rather comprehensive paper on the need for municipal public markets, with a discussion of the means and methods of operating such establishments. By G. V. Branch, Investigator in City Marketing, U. S. Dept. of Agriculture. 7 pp. published in Texas Municipalities, July, 1917, Bureau of Municipal Research and Reference, University of Texas, Austin, Texas. (Apply to *Texas Municipalities*, care of The Bureau, 20 cents per copy.)

Beaufort Under the Commission-Manager Plan. Chapter II.
This is the second annual report of the city of Beaufort since the adoption of the Commission-Manager form of government. Copies may be secured by applying to the City Manager, Beaufort, S. C.

A New Publication on Popular Government.
The National Popular Government League, 637 Munsey building, Washington, D. C., under date May, 1917, has brought out the first issue of its new official publication, entitled *Popular Government*, Judson King, Editor. 20 pages. (Apply to Editor, care of the League as above.) 10 cents per copy.

Social Service Training in Pennsylvania.
Bulletin 1917-1918 of the Pennsylvania School for Social Service, containing the school Calendar, Staff and Faculty, list of Special Lecturers, introductory note on The Problem of Training Social Workers, list of Courses, library, and General Information. 22 pp. (Apply to Bernard J. Newman, Secretary of the School, Charities Building, 425 South Fifteenth Street, Philadelphia, Pa.)

Woodbourne Real Estate Development.
Woodbourne, A Description of Single and Semi-Detached Houses Offered by the Boston Dwelling House Company, With Terms of Sale. Photographs, diagrams and plans. 32 pp. (Apply to Company at 308 Hyde Park Avenue, Jamaica Plain, Mass.)

Municipal Activities and Expenditures in New York City.
The Extension of Municipal Activities and Its Effect on Municipal Expenditures, Including a Review of the Budgets of New York Since Consolidation, 1898-1917. Lecture by William A. Prendergast, Comptroller, Delivered at the College of the City of New York, on February 14, 1917. 65 pp. (Apply to the Comptroller, Municipal Building, New York City.)

Annual Report of the City of Dayton.
Annual Report of the City of Dayton for the Year 1916. Published by the City Commission, June, 1917. 32 pp. (Apply to the Commission, Dayton, Ohio.)

Akron Bureau of Municipal Research.
Annual Report to the Board of Trustees and Contributing Members of the Akron Bureau of Municipal Research. Submitted January 1, 1917, by the Director, F. L. Olson. Forty-three mimeographed pages. (Apply to the Bureau of Municipal Research, 727 Second National Building, Akron, Ohio.)

Work of Juvenile Commission of Hartford.
Eighth Annual Report of the Juvenile Commission to the Mayor and the Court of Common Council of the City of Hartford, Conn., for the Year Ending April 30, 1917. 48 pp. (Apply to the Commission.)

City Planning in Cambridge.
Annual Report of the Planning Board to the City Council, 1916, Cambridge, Mass. Diagrams and maps. 10 pp. (Apply to the Planning Board.)

Nursing as a Vocation for Women.
Nursing as a Vocation for Women. By Katherine M. Olmstead, R. N.; Supervising Nurse, Wisconsin Anti-Tuberculosis Association, Milwaukee, Wis. Published as Bulletin of the Extension Division of the University of Wisconsin, Serial No. 814; General Series No. 610. 20 pp. (Apply to the University.) $0.10.

Workmen's Compensation Laws Here and Abroad.
Workmen's Compensation Laws of the United States and Foreign Countries, January, 1917. Publication of the Bureau of Labor Statistics, U. S. Department of Labor, Bulletin, Whole Number 203. Workmen's Insurance and Compensation Series, No. 8. 961 pp. (Apply to the Government Printing Office, Washington, D. C.)

Government Report on Colored Schools.
Summary of the Government Report on Negro Education, made by Dr. Thomas Jesse Jones, under the direction of Dr. P. P. Claxton, U. S. Commissioner of Education. Published by the Bureau of Education of the Department of Education. Two mimeographed pages. (Apply to the Bureau of Education, Washington, D. C.)

—yes, some twenty years ago

Twenty years ago, we made a big lot of Enameled Iron Street Signs for the City of Baltimore, but we haven't sold the City many since—only because

THE TOWN HASN'T NEEDED THEM

The signs we sold them twenty years ago are still doing business—that's the economy of "BALTO" Guaranteed Porcelain Enameled Iron Municipal Signs.

That's the proof that there is no "just-as-good."

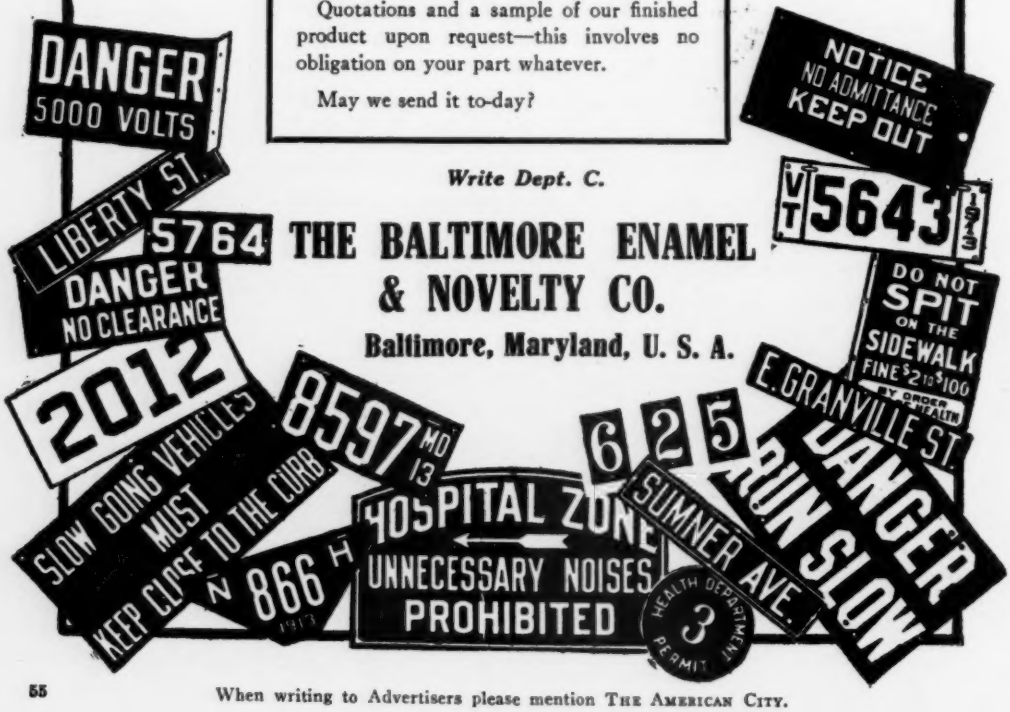
If you can afford to experiment with low prices (?) you're fortunate, but the taxpayer pays the freight. Our product is the one absolutely dependable out-of-door municipal sign on the market, and we can prove it if given half a chance.

GIVE US THE CHANCE TODAY

Quotations and a sample of our finished product upon request—this involves no obligation on your part whatever.

May we send it to-day?

Write Dept. C.



THE BALTIMORE ENAMEL & NOVELTY CO.

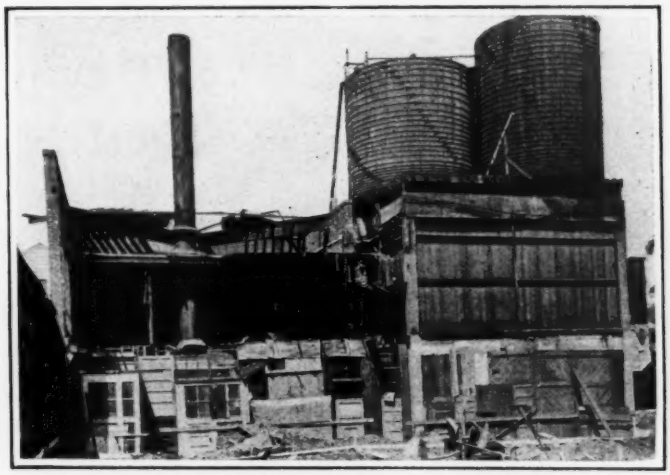
Baltimore, Maryland, U. S. A.

Methods, Materials and Appliances

News from Engineers, Manufacturers and Supply Houses

Fire-Resisting Wood Tanks

The immunity of Redwood Tanks to the action of fire is strikingly shown in the photograph appearing on this page. This was taken a short time after fire had wrecked the establishment of the New Parisian Dyeing & Cleaning Works, Inc., of San Francisco. A pine tank that had stood directly behind the Redwood tanks was completely destroyed.



REDWOOD TANKS WITHSTOOD THIS FIRE

These tanks are a product of the Redwood Manufacturers Company, Hobart Building, San Francisco, Cal. Their construction and installation, supplemented by general data and specifications, are set forth in Price List No. 14, "Remco Redwood Tanks," a catalog issued upon request by this company. Daily consumption statistics are furnished to aid in determining the size of the tank to be installed.

In addition to roof tanks, a number of other Redwood products are described in this catalog. The attention of highway officials is called to the "Remco" wagon tanks, which are adapted for use on sprinkling carts. The chief claims advanced in favor of the Redwood products are that they are not affected by extremes of temperature, and will resist deterioration, both in very dry and excessively wet localities. It is further claimed that they are not attacked by tropical worms and insects.

✣ ✣

Dallas, Tex., Adopts Bitulithic Resurfacing

On May 30, 1917, the City Commissioners of Dallas, Tex., received bids for repaving a part of Jefferson Avenue, involving 57,848 square yards in all. This street had been previously improved with asphalt macadam to a depth of 8 inches, rolled in two courses, and the upper layer poured with Texaco asphalt after compression. Under about four years' traffic the street had become worn down, and the taxpayers petitioned for its resurfacing.

Bids were received for resurfacing the old macadam with several types of pavement. After thoro investigation a specially appointed committee of fifteen taxpayers recommended the adoption of bitulithic, pursuant to which the City Commissioners, by a vote of 4 to 1, awarded the contract to the Texas Bitulithic Company for laying bitulithic as above outlined, utilizing the old asphalt macadam as a foundation for the new bitulithic surface.

✣ ✣

A Smoke and Ammonia Helmet

Among the innumerable fire-fighting devices, aggressive and protective, manufactured by the American-LaFrance Fire Engine Company, Elmira, N. Y., is a "safety-first" helmet of unusual interest. By means of this helmet and tank, which are shown herewith, a supply of pure air is guaranteed to the fire-fighter, while at the same time he is in no way obstructed in his work. As will be seen from the accompanying photograph, the tank is swung from the shoulders, and supplies air to the interior of the helmet, which is made of flexible leather, specially treated to make it non-porous and air-tight. This helmet is fitted with two large "lookout" openings equipped with glass or mica in a removable frame.

THE AMERICAN-LA FRANCE SMOKE HELMET

MOTT LAMP POSTS

STANDARDS OF MERIT

Special Designs of Lighting Standards For Type C Lamps

LAMP POSTS FOR ALL REQUIREMENTS

FOUNTAINS

Display and Drinking

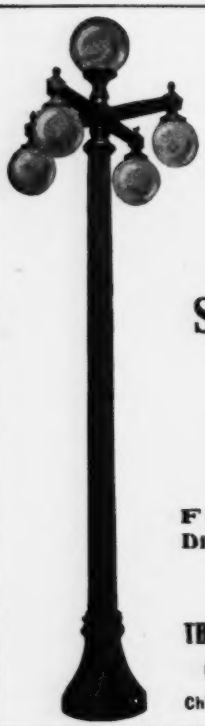
For PUBLIC SQUARES, PARKS, PLAYGROUNDS, Etc.

ENTRANCE GATES, RAILINGS, SETEES

CATALOGUES ON APPLICATION

THE J. L. MOTT IRON WORKS

Fifth Avenue and 17th Street, New York



OVER ONE THOUSAND PATTERNS

Write for free booklet illustrating an endless variety of artistic designs.

LAMP STANDARDS

FOUNTAINS
Display and Drinking

THE CASEY-HEDGES CO.
Chattanooga, Tenn.
Chicago, New Orleans, Cincinnati

Acoustile

THE PERFECTOR OF ACOUSTICS

A Permanent wall and ceiling treatment **guaranteed** to produce perfect conditions for hearing in Auditoriums, Court Houses, Churches, etc. No change in appearance of room necessary. Write for information and references.

MAZER ACOUSTILE CO.
Established 1909
Acoustical Engineers and Contractors
527 Third Ave., PITTSBURGH, PA

3c per M square feet

for labor to apply Atlas Chemical Weed-Killer. Permanently eliminates weeds for the entire season.

Diluted with 20 parts water and apply in sprinkling wagon or watering can.

Full particulars and prices furnished on request.

Chipman Chemical Engineering Co.
Incorporated
95 Liberty St. New York

ATLAS WEED-KILLER
Grass and Weed-Killing Chemical

The tank maintains the air supply indefinitely, or until used, and can be refilled by hand pump. There is no maintenance cost, as no oxygen or chemicals are used—just air. It has a capacity of 325 cubic inches, with a working pressure of 200 pounds per square inch. The rate at which air is expelled thru the outlet is regulated by means of a small regulating screw. The air outlet itself is controlled by a valve operated by a hand wheel. The tank is kept from shifting about from one side to the other by an adjustable waist strap. The whole outfit presents a compact, efficient device always ready for instant use.

TYPE OF STREET SIGNS

Durable Name Plates

Two things are required of signs for the guidance or warning of the public. First, they must be easily legible, and, second, they must be durable. When Johnnie gets his new air rifle or sling-shot, he looks around for a target—something plain, but not too easy to hit. Too often that target is the street sign. If that sign is easily damaged it is doomed.

The accompanying illustration shows a high quality, heavy galvanized iron plate into which the letters are countersunk, instead of being merely embossed. These letters are faced with aluminum over a well-prepared base coat. The face of the plate is covered with a high-grade black iron elastic paint, which, it is claimed, "will not crack, peal or flake." Thus these signs offer an effective resistance to climatic vicissitudes and stray ammunition. They are made by the Union Iron Products Company, Drawer H-2, East Chicago, Ind., and are described in a circular folder entitled "Something New in Steel Embossed Name Plates."

+ +

A New Day and Night Traffic Signal

One of the newest electric traffic signals on the market is that developed by the G. E. Painter Company, Baltimore, Md. The chief features of the new signal are that it is readily visible either by day or night on account of the arrangement of the lenses, lights and shades, which protect the lenses from the sun, thereby preventing a false signal from reflection.

The signals are made either to be located at the center of the intersection of two streets on a post or swung from a supporting wire above. If two are used diagonally opposite at intersecting highways they serve the double purpose of warning pedestrians as well as vehicles.

"The signal is fitted with a pair of lenses (one red and the other green) on each of the four sides, and is divided into four compartments with a lamp receptacle in each. The two diagonal compartments are lit at a time so as to display two red and two green lights as a signal for traffic to stop, say east and west, and move that going north and south. When the other two lamps are lit, the colors are reversed; thus the signal does not have to be turned to display the different colors. Standard 40- and 60-watt lamps are used for illumination. The lenses are of the spheroidal sector type, and the colors can be easily discerned a square away with the sun shining on the lenses, on both a vertical and a horizontal arc of 90 degrees. However, with the type of hood employed, it shades the lenses so that the sun will not strike them, except the lower part a few hours in the early morning and late in the afternoon."

The signals are about 15 inches high, and weigh complete with porcelain enamel hood about 31 pounds.

Ample provision is made for replacing worn-out lamps with little trouble, and the lenses are readily removable for cleaning, as they rest on a small ledge, from which they are easily lifted when the bottom is removed after loosing the screw in the bottom holder.

This type of traffic signal has proved very successful where it has been tried, and has been recommended for use at drawbridges by the Maryland State Road Commission.

A NEW ELECTRIC TRAFFIC SIGNAL

The men behind Clow Service and the quality behind Clow Materials

MAKE

CLOW CASTINGS

SUPREME

For the requirements of large Water Mains, Gas Works, Sewage Disposal Systems and Filtration Plants.

Get our figures on your regular and special requirements

QUICK SHIPMENTS OF
CAST IRON PIPE

JAMES B. CLOW & SONS

Established 1876

534-546 So. Franklin Street, CHICAGO

Sales Offices

New York Detroit St. Louis San Francisco
Minneapolis Milwaukee Denver Los Angeles

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SANITATION

While our "CANCO" garbage can in point of appearance and strength of construction is without a peer, yet our equipment—the most comprehensive in the country—is such that we can make any desired sort of garbage container

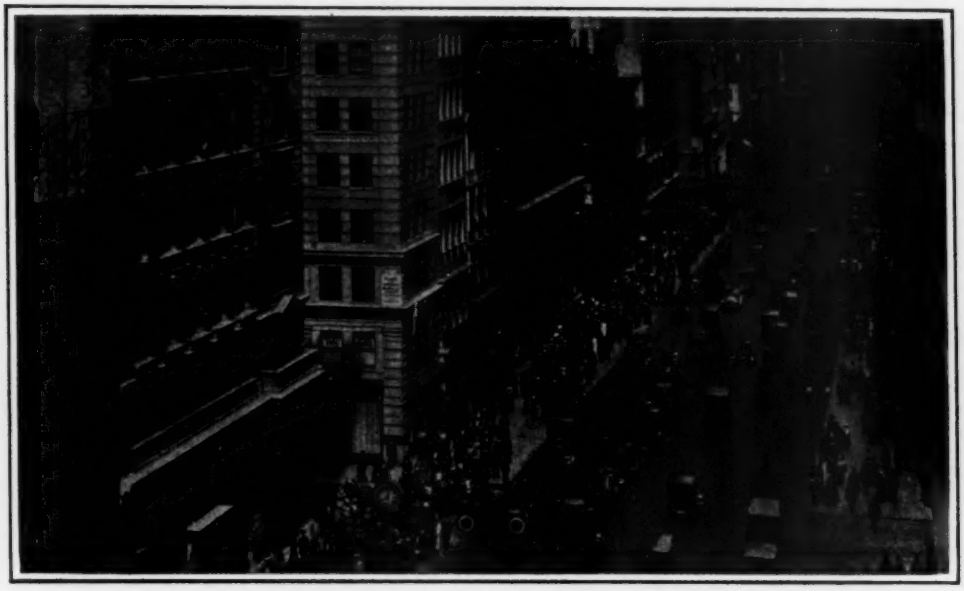
AMERICAN CAN COMPANY

NEW YORK

Chicago Toledo San Francisco

WITH OFFICES IN
ALL LARGE CITIES

For Contractors and Boards of Public Works



TRAFFIC ON FIFTH AVENUE, NEW YORK CITY

Paving for a Street with a Traffic Record

Fifth Avenue at Forty-second Street, New York, has long been known as the heaviest traffic center in the United States. A traffic census just completed by the Fifth Avenue Association shows that in spite of every effort to divert vehicles to other streets the avenue is maintaining its reputation.

According to the association figures, which represent vehicles of all kinds passing the Public Library, between Forty-first and Forty-second Streets, the volume of traffic totals in 10 hours (from 8 A. M. to 6 P. M.) 16,960 vehicles. Northbound and southbound traffic are about the same—8,513 northbound and 8,447 southbound. Included in the total of 16,960 are 1,296 motor busses—130 per hour in both directions. The total traffic averages 28 vehicles per minute.

At the point where this census was taken Fifth Avenue is 55 feet wide, which, theoretically at least, permits the movement of six lines of vehicles. The count showed that passenger motor vehicles composed about two-thirds of the traffic; but these included the ponderous motor busses, which are heavier than most commercial motor cars.

The pavement carrying this enormous weight, as well as volume of traffic, becomes of great interest to every community where street surfaces are going to pieces under increased wear and tear. It is sheet asphalt, 1½-inch close binder and 1½-inch top, on a 6-inch concrete base. It was laid in 1913, replacing a similar pavement which was 17 years of age when relaid. The analysis of the top mixture used in this pavement shows a high percentage of bitumen and a correspondingly high proportion of fine material. An average of 11.7 per cent of Trinidad asphalt was maintained thruout the laying of the pavement, altho 10.5 per cent was all that was required. The complete analysis of the surface mixture is as follows, the standard being given for comparison with the actual composition of the Fifth Avenue pavement:

	Standard Per Cent	Fifth Avenue Per Cent
Asphalt	10.5	11.7
200 mesh	13.0	17.3
100 mesh	13.0	10.0
80 mesh	13.0	22.0
50 mesh	24.0	23.0
40 mesh	11.0	5.0
30 mesh	8.0	8.0
20 mesh	5.0	2.0
10 mesh	3.0	1.0

The box measurements for the top mixture were 720 pounds of sand, 105 pounds of dust and 175 pounds of asphalt cement. For the binder course the measurements were 600 pounds of stone, 310 pounds of sand and 90 pounds of asphalt cement.

+ +

The Good Roads Movement Must Not Halt

In the hope that the splendid progress which has been made in the good roads movement

A Tread of Usual Size After 16,000 Miles

Service Stations in All Parts of the Country

Trucks That Follow the Sign of Good Service Take Less Time Out.

OUR large size GOODRICH DE LUXE Truck Tires have 40% more wearable tread-rubber than regular tires. That's *one reason* why they deliver from 100% to 200% greater mileage than other truck tires.

Another reason is the remarkably resilient rubber. Given the *same* thickness of tread as other tires, GOODRICH tread-rubber will actually outwear steel of equal thickness.

GOODRICH DE LUXE tires, after running 16,000 miles on this 5-ton Pierce-Arrow truck still retain all the mileage-giving, shock-absorbing vigor possessed by ordinary tires.

The sturdy, unscarred tread shows little evidence of the wear and tear of hauling capacity loads over rough roads.

Specify GOODRICH DE LUXE on your next order, and get the good service you deserve.

THE B.F. GOODRICH COMPANY

Makers of the Celebrated Goodrich Automobile Tires—
"Best in the Long Run"

Factories: AKRON, OHIO

GOODRICH TRUCK TIRES

during the last twelve months will suffer no abatement as the result of new conditions due to the war, S. M. Williams, sales manager of the Garford Motor Truck Company, has issued the following interesting statement:

"We have enrolled by the thousands for service in the trenches; we have over-subscribed the Liberty Loan bonds; we have responded to the Red Cross appeal in a noble manner; and in countless other ways during the last few weeks our people have conducted themselves as patriotic Americans should.

"All of which is as it should be. But reports have come in to the effect that in some localities the good roads movement has been allowed to slumber, and the excuse has been that other demands have taken up all the attention of the good roads advocate. A little reasoning will prove that that excuse is not a logical one.

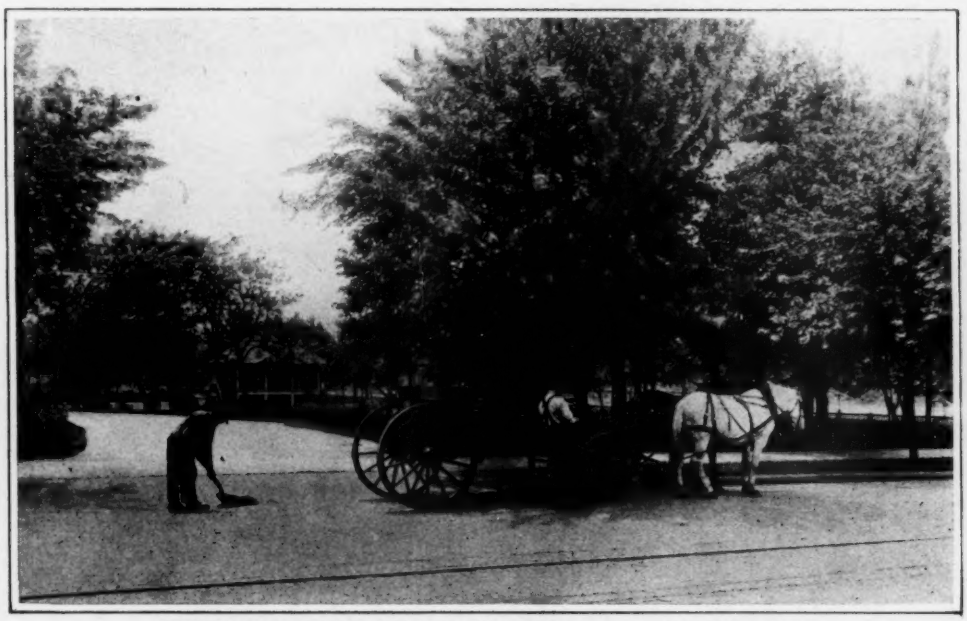
"We do not starve ourselves when we are helping our brothers in distress. We do not go without clothing when we are providing clothing for the less fortunate. We do not let our children suffer in an effort to alleviate the suffering of other children. On the other hand, we feed ourselves, clothe ourselves and care for our children as a matter of course. We do it in more or less the same way that we breathe —unconsciously. And the same attitude should should exist toward good roads work. It should be part of the routine in every community.

"Never was there a time in the history of our country when good roads were of such paramount importance. The war in Europe has demonstrated most fully that one of the best assets of a fighting nation is improved highways. So much has already been said along this line that it is but a waste of time to go further into the advantages of good roads in a warring country.

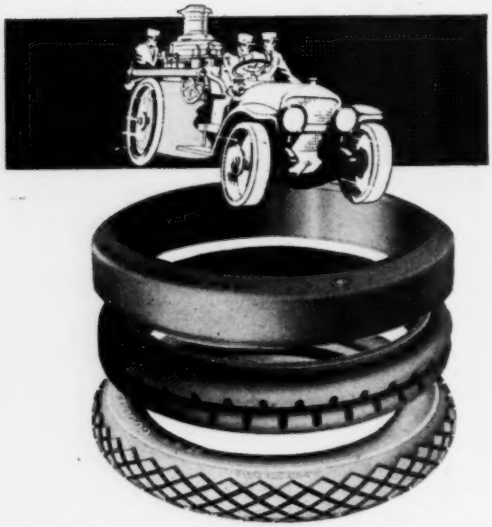
"Just as the United States has always led world progress, so should it lead in its highway development, irrespective of war conditions. However, unless we pay close attention to the good roads situation we shall find that many other nations have surpassed us in that branch of civic improvement and industrial development.

"Only the other day there came into my office a report that far-off China is fully awake to the importance of the road situation. Arrangements have just been completed there for the construction of a road from Shanghai to Woosung, the deep-water port at the point where the Hwangpu discharges into the Yangtze. A concession by an American company for a road in the environs of Peking was obtained recently, and plans are also announced for the construction of a road from Dairen, in the territory on the Kwangtung Peninsula, leased by Japan, to the summer resort at Hoshigaura, or Star Beach. All this means a great deal to China, and it should serve as a lesson urging us to get busy. From Venezuela come reports of the greatest public work ever attempted in that country, in the building of a 700-mile highway to connect Caracas and San Cristobal, to be known as the Great Western Highway.

"And so it is in practically all parts of the world, except possibly those countries in which the world's greatest battles are being fought. Therefore, the United States will have to look to her laurels with respect to good roads work. She has a reputation to sustain, and will only be able to do so if each district and each community will continue its road development with unabated zeal."



STUDEBAKER DUMP WAGON FOR REFUSE COLLECTION WORK



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First—because, for every type of apparatus, Goodyear makes a special tire which admittedly is best for that type.

Second—because the men who sell Goodyear Tires to Chiefs and Purchasing Agents are careful to recommend always the tire that fits the particular service.

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